

SENEY NWR
NARRATIVE REPORT - 1967

SENEY NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT

* 1967 *

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

SENEY, MICHIGAN

SENEY NATIONAL WILDLIFE REFUGE

PERSONNEL

Refuge Manager John B. Hakala *

Refuge Manager John E. Wilbrecht **

Assistant Refuge Manager Orlynn J. Halladay ***

Wildlife Biologist Gerald H. Updike

Refuge Forester Bernard S. Hubbard Jr. ****

Refuge Clerk Omer L. Doran

Mechanic George Orlich

Maintenance Man William G. Anderson *****

Maintenance Man Glen C. Losey

* * * * *

* Transferred to Region I, Alaska on 08-04-67

** E.O.D. 08-27-67 -- Transferred from Crescent Lake National
Wildlife Refuge, Ellsworth, Nebraska

*** Transferred to Death Valley National Monument, Death
Valley, California on 06-03-67 (National Park Service)

**** E.O.D. 04-03-67

***** Retired 08-12-67

SENEY NATIONAL WILDLIFE REFUGE

TEMPORARY PERSONNEL

Laborer Maintenance

	<u>E.O.D.</u>	<u>Terminated</u>
Thurman J. Skarritt Jr.	06-06-67	06-30-67

* * * * *

Laborers

		<u>E.O.D.</u>	<u>Terminated</u>
Tommy J. Early	*	06-14-67	09-19-67
Anthony D. Handrich	**	06-12-67	08-25-67
Susan L. Jack	**	06-12-67	09-13-67
Leo D. Lawrence		04-24-67	01-09-68
Harold E. Miller	*	06-13-67	02-09-68
Kim R. Strawe	*	06-14-67	09-22-67
Larry S. Strecker	***	06-12-67	09-15-67
Paul R. Thibideau		05-24-67	10-20-67
Lawrence Zellar		04-24-67	10-20-67

* Hired as laborers but filled the position of Wildlife Aids

** Hired 06-12-67 under the President's Youth Opportunity Campaign, was terminated 06-16-67 and rehired on 06-19-67 as a laborer.

*** Hired as a laborer but filled the position of Forestry Aid.

* * * * *

SENEY NATIONAL WILDLIFE REFUGE

TEMPORARY PERSONNEL

President's Youth Opportunity Campaign

	<u>E.O.D.</u>	<u>Terminated</u>
Ronald R. Anderson	06-13-67	09-01-67
Louis Berry	06-14-67	09-01-67
Gary L. Luukkonen	06-20-67	09-01-67

C O N T E N T S

Page

I. General	
A. Weather Conditions.....	1
B. Habitat Conditions.....	2
1. Water.....	2
2. Food and Cover.....	3
II. Wildlife	
A. Migratory Birds.....	4
B. Upland Game Birds.....	13
C. Big Game Animals.....	14
D. Fur Animals, Predators, Rodents, and Other Mammals.....	14
E. Hawks, Eagles, Owls, Crows, Ravens, and Magpies.....	15
F. Other Birds.....	16
G. Fish.....	17
H. Reptiles.....	18
I. Disease.....	18
III. Refuge Development and Maintenance	
A. Physical Development.....	19
B. Plantings.....	21
C. Collections and Receipts.....	22
D. Control of Vegetation.....	23
E. Planned Burning.....	23
F. Fires.....	23
IV. Resource Management	
A. Grazing.....	25
B. Haying.....	25
C. Fur Harvest.....	25
D. Timber Removal.....	26
E. Commercial Fishing.....	26
F. Other Uses.....	26
V. Field Investigation or Applied Research	
A. Waterfowl Disease Study	26
B. Blackfly Study	26
C. Land Use Planning	27
D. Pesticide Study	27
E. Student Assistant Projects	27
VI. Public Relations	
A. Recreational Uses.....	28
B. Refuge Visitors.....	30
C. Refuge Participation.....	36
D. Hunting.....	40
E. Violations.....	41
F. SAFETY.....	42
VII. Other Items	
A. Items of Interest.....	44
B. Photographs.....	
C. Signature.....	49

I. GENERAL

A. Weather Conditions

	<u>Month</u>	<u>Precipitation</u>		<u>Max. Temp.</u>	<u>Min. Temp.</u>
		<u>Normal *</u>	<u>Snowfall</u>		
January	<u>2.86</u>	<u>1.93</u>	<u>45.0</u>	<u>44</u>	<u>-19</u>
February	<u>1.82</u>	<u>1.80</u>	<u>39.5</u>	<u>36</u>	<u>-31</u>
March	<u>1.11</u>	<u>2.09</u>	<u>7.5</u>	<u>58</u>	<u>-30</u>
April	<u>2.45</u>	<u>2.44</u>	<u>1.0</u>	<u>59</u>	<u>8</u>
May	<u>2.14</u>	<u>2.96</u>	<u> </u>	<u>74</u>	<u>23</u>
June	<u>3.67</u>	<u>3.44</u>	<u> </u>	<u>85</u>	<u>36</u>
July	<u>1.04</u>	<u>2.48</u>	<u> </u>	<u>86</u>	<u>37</u>
August	<u>2.37</u>	<u>3.34</u>	<u> </u>	<u>84</u>	<u>37</u>
September	<u>.86</u>	<u>3.59</u>	<u> </u>	<u>86</u>	<u>30</u>
October	<u>4.38</u>	<u>2.65</u>	<u>2.5</u>	<u>78</u>	<u>25</u>
November	<u>2.02</u>	<u>3.03</u>	<u>20.0</u>	<u>52</u>	<u>3</u>
December	<u>1.66</u>	<u>2.43</u>	<u>24.75</u>	<u>46</u>	<u>-18</u>
Annual Totals	<u>26.38</u>	<u>32.18</u>	<u>140.25</u>	Extremes <u>86</u>	<u>-31</u>

The weather data listed above were collected from daily weather observations at the official weather station located at refuge headquarters.

* Based on a nineteen year average (1949-1967).

Weather

January temperatures were normal, with snow and cold weather prevailing. Precipitation was recorded on 27 days of the period. February remained the same with precipitation being observed on 22 days. March brought a warm-drying trend. Precipitation fell on only 8 days of this period and 9 inches of snow covered the ground at the close of the month. April temperatures steadily increased with total snow disappearing on the 5th.

Sub-zero temperatures were noted on 30 days of the period, with a breakdown as follows: January -- 5; February -- 13; March -- 8; and December -- 4. Last frost of spring was on May 22 and the first frost of fall occurred on September 10. However, a frost killing the buckwheat crop at the Walsh Farm Unit was recorded on August 4. This farm unit is located approximately 12 miles northwest of Refuge Headquarters. At the headquarters area there were 111 continuous frost-free days during 1967. Normal growing season at Seney usually ranges from 75-85 days.

Temperatures during the summer period were near normal with precipitation slightly below average. Fall temperatures again remained normal to slightly above. Ordinarily high summer temperatures range in the upper 70's and lower 80's. Fall temperatures range in the 50's and low 60's.

First snow of the season arrived on October 23 but the 2 inch snowfall disappeared the following day. Snow came to stay on November 13. This was one month early, as snow usually comes to stay between December 10-15. Ice occurred in bays and borrow ditches on November 5 with total freeze-up on November 27.

In summary -- snowfall during the 1966-67 winter totaled 169.5 inches. This broke all records since 1941, when weather data collection started at Seney. The average annual snowfall is 116.6 inches taken from 26 years of record keeping. Although precipitation was down 7.23 inches from a year ago there was adequate ground moisture throughout most of the year.

B. Habitat Conditions

1. Water

Spring break-up and run-off occurred on April 1-2. A heavy snow accumulation and unseasonably warm weather the last week of March (snow depth went from 17 inches on March 30 to nine inches on March 31) caused the rapid run-off. Pools were low and all boards were removed from the Driggs River dam, thereby, preventing any

damage to refuge dikes or control structures. Refuge pools opened up quickly and predation on nesting geese was held to a minimum.

Pools were all lowered in late June after waterfowl nesting was completed. H-1 and G-1 Pools were drawn down during the summer months. D-1 Pool was lowered to provide badly needed goose graze and for constructing a grazing site adjacent to the pool.

Permanent freeze-up occurred the week of November 27 - December 2, same as last year.

Three problems pertaining to refuge surface waters were investigated during 1967 as follows: (1) Heavy siltation in the Diversion Ditch. The situation was checked by refuge and Regional Office personnel but no action has been taken or suggested. (2) Drainage problems at the town of Germfask. Some town people feel the refuge pool system is responsible for high water which does not drain away in the spring. However, on-the-ground investigation has shown that former drainage ditches between the town and the Manistique River have been filled by developers, thereby creating the problem. (3) A meeting was held to determine whether or not gauging stations on the Manistique River should be continued. U.S. Geological Survey, Regional Office and refuge personnel agreed the two stations should be maintained to determine refuge outflow, four partial gauging stations should be established for 3-5 years to get more precise out-flow data and when the need arises, inflow stations should be established.

2. Food and Cover

Generally, there was ample food and cover for all species of wildlife. Resident wildlife found both food and cover somewhat reduced early in 1967, but a quick thaw relieved the situation.

Goslings made excellent use of headquarters lawns, the M-77 roadside and dikes which had been mowed. A one acre grazing site at D-1 Pool was used in the fall and more grazing sites are scheduled for 1968.

Geese made excellent use of the new permanent pasture adjacent to Lower Goose Pen Pool. Oats were planted with a seeding of clover and perennial grasses on 14 acres of farm land. This permanent type pasture has proven successful in other areas and should provide badly needed graze at Seney.

Sharp-tailed Grouse, deer and geese made heavy use of oats which had sprouted after being rotary mowed at Walsh and Diversion Farms. Rye planted in late summer was also a favorite on the above farm fields.

Buckwheat continued to be the favorite food in this area for geese. It is difficult to harvest enough buckwheat for seed before the

geese completely utilize the crop. Dry conditions prevented hay from coming back well on the north end of the refuge and it provided little graze.

Geese made heavy use of wheat fields in the local area and the refuge may plant some wheat in 1968.

Sandhill Cranes were observed in large numbers feeding along shallow pool edges and in pools which were drawn down.

White-tailed Deer were commonly seen feeding on the Walsh, Diversion and Chicago Farms.

II. WILDLIFE

A. Migratory Birds

1. Waterfowl

a. Geese

The first Canada Geese, a pair with one having a white collar, were observed below I-1 Pool on the morning of March 19. No other geese were seen until March 22. Pools were completely frozen over at the time and there was 24" of snow on the ground. The March 19 arrival date is average, but over two weeks later than the March 4 arrival date of 1966.

Between March 25 and April 1 the number of returning geese increased from 50 to 450. A final count of returning Seney geese was recorded at 700 on April 15, approximately 200 more than one year ago.

Egg laying started on April 7 and incubation April 15. The first brood was observed on May 11 at the visitor center as compared to May 9 one year ago.

Nest depredation was reduced even more from the low level of 1966. Predators destroyed 29 nests (14%) and 60 eggs (5%) in 1967. (Crows were responsible for destroying eggs during the laying period.) No nesting geese were known to have been killed.

Eggs hatched totalled 912 compared with 818 in 1966. No severe losses occurred to goslings and approximately 675 reached flight stage. The 1966 and 1967 nesting survey summaries are presented in Table 1.

Table 1. A Comparison of Results of the 1966 and 1967 Canada Goose Nesting Surveys at Seney Refuge.

	1966		1967	
	Number	Percent	Number	Percent
Nests Destroyed	57	24	29	14
Nests Deserted	8	3	8	4
Nests Hatched	174	73	176	82
Total Nests	239	100	213	100
Eggs Destroyed	190	17	60	5
Eggs Unhatched	78	7	122	11
Eggs Deserted	29	3	33	3
Eggs Hatched	818	73	912	81
Total Eggs	1,115	100	1,127	100

Gosling losses due to blood diseases transmitted by the black fly could have been severe had it not been for a cold spell which prolonged the fly hatch. Of 94 goslings examined, all were positive for the blood disease Leucocytozoon. This large rate of infection and four year die-off cycle indicates that severe losses may be expected in 1968. Disease research being conducted by Patuxent Wildlife Research Center is discussed in Part V, Field Investigations, of this report.

Peak populations of Canadas, Blues and Snows were recorded at 6,000, 100 and 100 respectively (Table 2). Fall goose use days totaled 241,150, an increase of approximately 25,000 over 1966. Snow storms during the week of November 18-24 moved most of the geese out of Upper Michigan.

Table 2. Peak Fall Goose Numbers at Seney Refuge, 1963 - 1967

Species	1963	1964	1965	1966	1967
Canada Goose	4,400	6,000	4,400	5,100	6,000
Blue Goose	150	600	150	175	100
Snow Goose	100	400	100	100	100
Total Geese	4,650	7,000	4,650	5,375	6,200

The last of the Seney geese were observed at B-1 Pool on November 25, a week earlier than the December 2 departure date of 1966.

A total of 584 geese were captured during banding operations. Bands were placed on 368 of these birds as the rest were retraps. Most of the birds were captured by means of drive trapping on E-1, B-1, D-1, F-1, C-3 and the Lower Goose Pen Pools during July. Cost of the entire 1967 goose banding program was \$1,200. Table 3 shows the results of goose trapping efforts since 1957.

Table 3. Seney Canada Goose Banding and Kill Data, 1957 - 1967

<u>Year</u>	<u>Number Banded</u>	<u>Number Retraps</u>	<u>Total Trapped</u>	<u>Total Returns</u>	<u>Direct Returns</u>	<u>% Direct Returns</u>
1957	42	6	48	16	10	23.8
1958	186	19	205	37	20	10.8
1959	230	46	276	26	16	7.0
1960	160	227	387	12	6	3.8
1961	119	64	183	7	7	5.9
1962	345	86	431	47	19	5.5
1963	219	155	374	36	15	6.8
1964	316	225	541	46	15	4.7
1965	168	107	275	78	30	17.8
* 1966	343	227	570	71	26	7.6
* 1967	368	216	584	--	--	----

* Goose hunting season closed locally.

The band return data are somewhat misleading in that immature geese from Lower Michigan are inadvertently banded at Seney. Trapping ceases as soon as the first fall migrants arrive in September. Molting geese from southeastern Michigan are banded during July and it was thought that capturing geese only in August with a cannon net would eliminate the problem. However, during 1967 three free flying geese with bands from Shiawassee National Wildlife Refuge were captured by means of cannon netting in August. As more geese are banded in southeastern Michigan, a correction factor may be applied.

b. Ducks

The duck population increased somewhat during 1967 (Table 4). Total production was calculated at 1,010.

Table 4. Peak Duck Numbers and Use-Days for May - August, 1958-1967

<u>Year</u>	<u>Population Peak</u>	<u>Use-Days</u>
1958	6,755	704,040
1959	6,686	571,582
1960	3,445	239,820
1961	4,100	300,521
1962	3,670	266,700
1963	1,600	179,313
1964	2,365	220,788
1965	1,595	157,624
1966	1,540	172,935
1967	1,650	172,650

Table 5 compares the peak fall duck population for years 1964-1967.

Table 5. Peak Fall Duck Populations at Seney Refuge, 1964 - 1967

<u>Species</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Mallard	1,000	650	650	1,400
Black Duck	1,000	800	650	1,050
Pintail	15	5	10	10
Green-winged Teal	300	150	75	350
Blue-winged Teal	500	500	500	600
Baldpate	800	150	300	600
Woodduck	450	150	350	325
Redhead	10	10	0	15
Ring-necked Duck	3,200	4,500	4,000	10,000
Canvasback	0	0	0	5
Scaup	250	25	10	40
Goldeneye	50	50	75	40
Bufflehead	100	75	20	20
Hooded Merganser	150	150	100	300
Common Merganser	140	150	60	150

Trapping and Banding

Excellent duck banding results were attained again in 1967 (Table 6). The total of 1,930 ducks banded was approximately the same as in 1966 and only the second time in Seney history that over 1,000 ducks were banded. The most successful trap was the modified dove trap for Blue-winged Teal. Three traps at one site accounted for 68 new teal in a single day. The Ohio type trap accounted for most of the other ducks. Limited success with the cannon net at M-2, H-1 and E-1 Pools was experienced. The three Colorado traps on A-1, I-1 and J-1 Pools did not catch enough ducks to justify their continued use. It was demonstrated that Ring-necked Duck broods can be fairly easily captured off sand bars in about 12 inches of water. Shelled and cob corn was the only bait used.

Table 6. Ducks Banded at Seney Refuge -- 1967

Species	Adult Female	Adult Male	Imm. Female	Imm. Male	Local Female	Local Male	Unk.	Total
Mallard	59	38	224	236	6	4	3	570
Black Duck	32	43	116	194	4	5	4	398
Woodduck	12	74	15	13	2	1	2	119
Ring-necked Duck	12	3	13	9	34	47	3	121
Blue-winged Teal	68	97	269	252	0	0	7	693
Green-winged Teal	6	14	1	3	0	0	1	25
Redhead Duck	0	0	0	2	0	0	0	2
Baldpate	0	2	0	0	0	0	0	2
Totals	189	271	638	709	46	57	20	1,930

Table 7 compares duck banding results and catches for the years 1965 through 1967.

Table 7. A Comparison of Duck Banding Results -- 1965-1967

Item	1965	1966	1967
Ducks Banded	433	2,020	1,930
Predation Loss	17 (3.9%)	55 (2.7%)	65 (3.4%)
Drowning Loss	1 (0.4%)	14 (0.7%)	8 (0.4%)
Traps in Use	13	21	15
No. Trapping Days	61	70	58
Man Hours Expended	250	490	450
Ducks Banded/Man Hour	1.7	4.1	4.3
Ducks/Trap/Day	.53	1.37	2.21
Approx. Total Cost	\$650.00	\$1,900.00	\$1,500.00
Cost/Banded Duck	\$ 1.50	\$.94	\$.78

Band Return Data

Exhibits I and II (pages 10 and 11) plot direct band returns of the five major species of ducks banded at Seney during the fall of 1966. The 167 direct returns were from 24 states, Canada, Cuba and the British West Indies and are broken down by species in Table 8.

Table 8. Band Returns

<u>Species</u>	<u>Number * Banded</u>	<u>Number Direct Returns</u>	<u>Percent Direct Returns</u>
Black Duck	461	52	11.3
Mallard	625	62	9.9
Woodduck	278	24	8.6
Ring-necked Duck	185	14	7.5
Blue-winged Teal	443	15	3.4
Totals	1,992	167	8.4

* Chart represents only the five major species banded during 1966 and direct returns from those species.

Ring-necked Duck Status

The Ring-necked Duck was studied as a summer project by Wildlife Aid Tom Early. The study consisted of searching for nests, observing and recording brood information and trapping broods for banding. No nests were located this year, but possibly another year checking should start earlier. A brood census of Unit I on July 29 revealed 38 broods and a total of 185 ducklings (4.87/brood). E-1 Pool alone accounted for 27 of the broods. A build-up of broods on E-1 by date was: June 15, no broods; June 27, nine broods; July 6, fourteen broods; July 15, nineteen broods; and July 27, twenty-seven broods. Banding efforts resulted in the capture of 111 "new" Ring-necked Ducks. The banding summary was: Adult male -- 1; immature male -- 7; local male -- 46; adult female -- 10; immature female -- 15; local female -- 32. Three adult females, banded with broods in 1966, were retrapped with their broods again in 1967.

SENEY NATIONAL WILDLIFE REFUGE, MICHIGAN

DIRECT RETURNS

- Mallard
- Black Duck
- Woodduck
- Ring-neck Duck
- Blue-wing Teal

EXHIBIT I

SENEY NATIONAL WILDLIFE REFUGE, MICHIGAN

DIRECT RETURNS

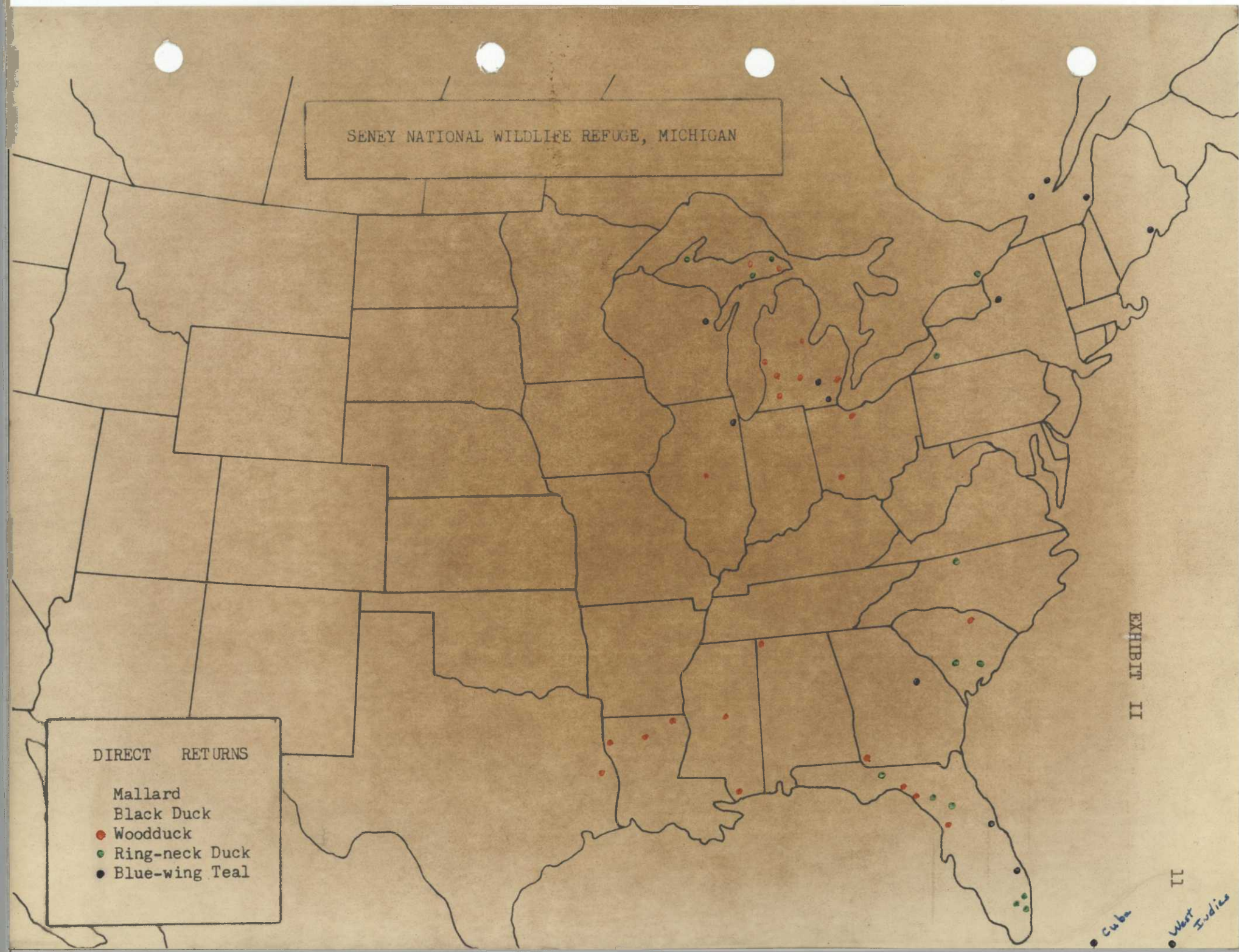
- Mallard
- Black Duck
- Woodduck
- Ring-neck Duck
- Blue-wing Teal

EXHIBIT II

II

Cuba

West Indies



Nest Box Check Results

Duck nesting boxes were checked and a summary report written by Wildlife Aid Kim Strawe. Of the 138 nesting boxes, 41 were used by waterfowl (30.6%). Four Common Mergansers nested in barrel type structures with a hole opening of $4\frac{1}{2}$ " in diameter. Nearly 25% of all boxes were used by the Hooded Merganser. Table 9 summarizes results of the 1967 nest box survey.

Table 9. Nesting Box Survey Results, Seney Refuge -- 1967

<u>Species</u>	<u>Use</u>		<u>Success</u>	
	<u>No.</u>	<u>Percent of Total</u>	<u>No.</u>	<u>Percent</u>
Woodduck	2	1.5	2	100
Hooded Merganser	34	24.6	30	88
Common Merganser	4	2.9	2	50
Goldeneye	1	.8	0	0
Starling	24	17.4		
Flicker	3	2.2		
Squirrel	20	14.5		
Unknown	14	10.0		
Not Used	32	23.2		
Not Located	4	2.9		
Totals	138	100.0	34	

c. Coot

Peak fall number was 90, twice that of 1966 but much lower than the high of 300 in 1963. About 30 Coot spent three weeks near Quarters #1.

d. Swans

Five Whistling Swans were observed during the spring migration. Two were seen April 19 on M-2 Pool and three on F-1 Pool the same

day. Two immature swans spent late April and early May on the Show Pools and were observed by many passing motorists.

Only two swans were noted during the fall migration, these being October 31 on A-2 Pool.

2. Other Waterbirds

The first returning Common Loons were seen April 13, one week later than in 1966. Fourteen pair nested on the refuge and raised 22 young. The first chick was observed on June 2. Refuge population was estimated to be 50 at the end of the summer period. Last loon observation was September 17.

Sandhill Cranes were first observed at the Show Pools on March 31, seven days earlier than in 1966. Following the hatch the estimated population was 125, 25% more than a year ago. As many as 40 cranes were observed feeding on the back edge of C-3 Pool during July. They also made excellent use of H-1 Pool which was in draw-down. Last crane observation was October 16.

March 28 was the arrival date of the Great Blue Heron. Their peak numbers increased to an estimated 125.

At 12:35 P.M. on April 19 Manager Hakala reported seeing three Whooping Cranes circling high over Lower Goose Pen Pool. Weather was clear and warm and the cranes left in an east-northeast direction before the observation could be verified. It was later learned that a woman 20 miles east of the refuge reported seeing three Whooping Cranes to the Michigan Department of Conservation on the same date, again no verification.

3. Shorebirds and Gulls

The first Common Snipe was noted on April 9. Excellent late summer flights of snipe were noted in the headquarters area. Thirty-nine snipe were mist netted and banded at headquarters.

Yellowlegs, Killdeer, Spotted Sandpipers, Black Terns, Common Terns, Ring-billed Gulls and Herring Gulls were noted on the refuge from time to time.

B. Upland Game Birds

Woodcock numbers appear to be remaining high at Seney. The Woodcock singing ground count, conducted May 8 and May 13, recorded 49 peenting birds on two routes. This is an increase of 16 over the 1966 count. Peak fall numbers were estimated at 3,000, but no intensive inventory work was done.

Sharp-tailed Grouse numbers appear to be a little lower than a year ago. Dancing ground counts tallied 79 birds this year compared to 91 in 1966. An estimated 275 birds were using the refuge by early fall. Controlled burns have been planned for 1968 in an attempt to "open up" the dancing grounds and thick willow stands.

Observations of Ruffed Grouse indicated that their numbers were slightly increased over 1966. An estimated 2,000 were using the refuge at the beginning of the fall period.

Spruce Grouse observations increased greatly over past years. Observations were made south of Chicago Farm and just north of Walsh Farm on several occasions. Estimated fall population was 150. Harold Miller, student laborer, conducted a brief summer study of the Spruce Grouse at Seney. Thirty-six grouse observations were recorded during 41 hours of field work. The grouse were commonly observed in jack pine trees and often when flushed from the ground they would land in a jack pine. Approximately 20 sections of land (mostly the southeast corner of the refuge) contain suitable Spruce Grouse habitat.

C. Big Game Animals

The first White-tailed Deer observation was made April 4, one week later than last year. Deer were confined to wintering yards only during the 1966-67 winter and severe starvation was feared. However, very rapid break-up and unusually warm weather early in April kept losses low. The beginning of the 1967-68 winter has been relatively mild and deer are not restricted to yarding areas.

The first fawn was observed on June 2. During May and June, observed deer totaled 642 for 502 man-hours in the field. This was 1.28 deer per man-hour in the field, as compared to 0.69 for 1966.

Black Bear observations increased for the third straight year. Fourteen observations were made as compared to 10 in 1966. During July a 205 pound nuisance male bear was captured and moved from the Driggs Picnic Area to a swamp west of Munising (50 miles). No bear were taken during the refuge big game season and an estimated 25 were using the refuge.

D. Fur Animals, Predators, Rodents and Other Animals

The refuge Otter population was estimated to be about 150 animals. Thirty Otter were observed during the October 31 waterfowl census.

Beaver numbers continued to increase. These animals have created excellent waterfowl habitat in certain areas and caused problems in others. It was again necessary to remove Beaver dams near J-1 and Lower Goose Pen Pools and along Diversion Ditch. The refuge was closed to Beaver trapping, but plans are underway for a 1968 trapping season.

Muskrat are increasing rapidly in certain areas, especially Upper Unit I and below C-3 Pool. Their activity has opened up dense cattail marshes with no damage to the sand dikes. The permittee mink trapper caught 28 muskrat, all in good condition.

Mink were responsible for destroying 60 captured ducks, 35 in one trap, during banding operations. A control program was carried out with the one trapper concentrating near duck banding sites. Sixteen mink were caught and two were destroyed while in duck traps.

Woodchuck were commonly seen along refuge roads from the first sighting on March 19 until late September.

Striped Skunks are not numerous although observations increased and 12 skunks were removed, five more than in 1966.

Refuge mammalian predators include Coyote, Red Fox, Bobcat and Raccoon. Fox and Bobcat numbers are low and do not constitute a problem. Coyote and Raccoon numbers appear to have been reduced slightly by the animal control program. Refuge personnel and one permittee trapper removed 48 Raccoon, 24 Coyote, 3 Bobcat and 10 Red Fox during 1967.

One Gray Wolf was observed from the air on April 5 by Manager Hakala and Pilot-Biologist Winship. The wolf was observed heading north in Section 33, T46N, R15W. A local hunter reported seeing a wolf near T-2 Pool on November 18. No confirmation was made.

E. Hawks, Eagles, Owls, Crows and Ravens *Sney*

The Marsh Hawk was the most abundant hawk again in 1967. There was an unusually large number of Rough-legged Hawks observed during fall migration and they lingered in the area to feed on high populations of mice and voles. Fifteen Rough-legged Hawks were observed at Diversion Farm on October 11. Other hawks not as commonly seen include: Pigeon Hawk, Sparrow Hawk, Broad-winged Hawk, Sharp-shinned Hawk and Osprey.

Bald Eagles remained at a dangerously low level with four territories being occupied during 1967. In two instances, C-3 and B-1 Pools, an adult accompanied by a bird in the immature plumage worked on nests but no egg laying took place. The C-2 Pool pair nested but after a long incubation period no young were produced and they were seen frequently at the M-2 Pool nest the remainder of the summer. The pair at E-1 Pool successfully raised two eaglets. Total fall refuge eagle population was 10, two less than 1966.

An immature bald eagle was shot and killed just north of Curtis, Michigan, on September 3.

One Snowy Owl was observed on February 2, another on November 16, and two on December 20.

Crows were abundant in the spring and destroyed some goose eggs. Fifty-six crows were captured by means of cannon net at headquarters. Blood samples were taken and the birds disposed of. Ravens are not as common on the refuge now that the township dump has been filled in.

F. Other Birds

Spring arrival dates of some of the other birds, as recorded by refuge personnel, are shown in Table 10.

Table 10. Spring Arrival Dates of Birds at Seney Refuge -- 1967

<u>Date</u>	<u>Species</u>	<u>Date</u>	<u>Species</u>
3-12	Starlings	3-30	Grackle
3-12	Marsh Hawk	4-3	Song Sparrow
3-24	Red-winged Blackbird	4-4	Meadowlark
3-29	Robin	4-7	Phoebe
3-29	Killdeer	4-7	Flicker
3-30	Kingfisher	4-24	Martins
3-30	Cowbirds	5-10	Mocking Bird *

* Not common in this area

Results of the 1967 Christmas Bird Count, conducted by Manager Wilbrecht and Biologist Updike, on December 20, are shown in Table 11.

Table 11. Results of the December 20, 1967 Christmas Bird Count

<u>Species</u>	<u>Number</u>	<u>Species</u>	<u>Number</u>
Blue Jay	12	Black-capped Chickadee	20
Common Raven	68	Red Crossbill	8
Ruffed Grouse	4	Starling	1
Sharp-tailed Grouse	6	Pine Grosbeak	6
Snowy Owl	2	Snow Bunting	70
Gray Jay	3	Ruff-legged Hawk	2
Common Crow	14		

Totals: 13 species -- 216 individuals

On May 5 Biologist Updike and his wife observed a male Yellow-headed Blackbird at Quarters #136, the first known observation of this species on the refuge.

G. Fish

Michigan Department of Conservation fishery biologists removed fish from a number of refuge pools during April as shown in Table 12. The pike catch nearly doubled from the poor year of 1966. In accordance with the cooperative agreement, 20% of the legal sized pike were released in the Show Pools along with all the Yellow Perch. Remaining pike were released in nearby spawning marshes (Table 13). Bullheads and suckers were thrown along the refuge dikes for eagles and other birds.

Table 12. Fish Removal Record From Refuge Pools -- 1967

<u>Date</u>	<u>Species Removed</u>				
	<u>Northern Pike</u>	<u>Perch</u>	<u>Bullheads</u>	<u>Sucker</u>	<u>Other</u>
4-6	9	1	10		3
4-7	32	2	1		1
4-10	48	173	12	1	6
4-13	218	70	278	13	57
4-14	86	21	329	6	
4-17	155	110	1,431	76	10
4-19	35	29	344	10	6
4-25	95	93	578	40	4
Totals	678	499	2,983	146	87

Table 13. Plantings of Pike Taken From Refuge Pools -- 1967

<u>Date</u>	<u>Number</u>	<u>Location</u>
4-14	50	Steuben Lake
4-14	48	Carp Lake
4-14	100	Brevort Lake
4-17	92	Pike Lake
4-19	50	Steuben Lake
4-19	118	Refuge Show Pools
4-20	100	Musgrave Lake
4-31	120	Macaulay Marsh

Table 14 shows Northern Pike removal from the refuge by pool and date. D-1 Pool was in draw-down during the winter and fish were concentrated near borrow ditches.

Table 14. Northern Pike Removal Record by Pool -- 1967

Date	D-1	E-1	F-1	Pool		H-1	I-1	Totals
				G-1				
4-6		9						9
4-7	29	3						32
4-10	43	4					1	48
4-13	31	46	110	10	21			218
4-14	11	31	35	5	4			86
4-17	18	75	43	16	3			155
4-19	7	19	4	3	2			35
4-25	21	35	21	6	12			95
Totals	160	222	213	40	42		1	678

H. Reptiles and Amphibians

A Painted Turtle was seen on April 5 near headquarters. The first Eastern Garter Snake was observed on April 20 and a Snapping Turtle on April 9. No commercial turtle trapping was conducted during 1967. However, several snappers were picked up and removed by the refuge staff while conducting routine work during spring and early summer. Snapping Turtle numbers remain high and a continuing control program would benefit both goslings and ducklings. Painted Turtle numbers are high, but not being predaceous, little attention is given them.

I. Disease

Approximately 75 goslings died of disease during May and June. Exact cause of death was not determined, but Leucocytozoon and/or Aspergillosis are suspected. The loss is slightly higher than 1966 but considerably lower than the 1964 loss of 500 goslings.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Buildings and Grounds

- a. Painted exterior of all headquarters buildings.
- b. Repaired Wigwam Picnic Area fireplace, roof and gate.
- c. Had new water conditioning unit installed in Sub-headquarters, Residence #7.
- d. Pressurized headquarters water system.
- e. Constructed storm entrance shed for carpenter shop.
- f. Rebuilt headquarters bulletin board.
- g. Renovated headquarters, Quarters #1, and Quarters #136 lawns (new topsoil, fertilized, seeded and mulched).
- h. Installed two new hand water pumps over wells at C-3 and Driggs Picnic Areas.

2. Roads and Trails

- a. Restained and repainted all directional and informational signs constructed last year.
- b. Salvaged 74 telephone poles along M-77 abandoned by telephone company.
- c. Replace culvert in Marsh Creek Road wash-out.
- d. Remove gravel from Chicago Farm Road and spread on Marsh Creek Road.
- e. Installed several culverts on Chicago Farm By-Pass Road.
- f. Began reconstruction of Pine Creek Road -- graded 4 miles and gravelled 2 miles.

3. Equipment Repairs -- Major

- a. Rebuilt radiator on John Deere 420.
- b. Complete motor overhaul of 1951 IHC stake truck.
- c. Complete motor overhaul of 1956 Dodge stake truck.
- d. Complete motor overhaul of Ferguson tractor.
- e. Painted 1952 Dodge 4x4 Weapons Carrier (Refuge fire truck).
- f. Replaced final drive gear in John Deere 420.
- g. Replaced new rails on John Deere 420.

4. Water Facilities and Habitat

- a. Constructed and installed SAFETY walkway to 4x4 control structure on M-2 Pool.
- b. Constructed one acre goose grazing site northeast side of D-1 Pool from a peninsula by leveling, hauling and spreading topsoil, fertilizing and seeding.
- c. Established 7 small goose grazing sites along dikes.
- d. Completed goose nesting island brushing of M-2, C-2, A-2 Pools and started in C-3 Pool.

5. Equipment Acquisitions and Disposals

- a. Purchased used Ski-Doo and trailer (\$1,050.00).
- b. Purchased new John Deere 10' hydraulic disc (\$800.00).
- c. Purchased three gasoline driven water pumps for fire fighting (\$150.00 each).
- d. Purchased 3" diaphragm pump with gas Briggs & Stratton engine for pumping waste oil to tank truck (\$415.00).
- e. Purchased new 20" lawn mower (\$80.00).
- f. Transferred 1955 Reo stake truck, 6x6, 2½ ton, to HEW.
- g. Transferred 1954 Ford dump truck, 2½ ton to HEW.
- h. Transferred 1951 Dodge dump truck, 2½ ton to HEW.
- i. Transferred Case tractor, front-end loader to HEW.
- j. Transferred Beseler Opac projector to HEW.
- k. Transferred Thermo-Fax copying machine to HEW.
- l. Transferred Thermo-Fax copying machine to Shiawassee Refuge.
- m. Transferred Sunray propane range to Northern Prairie Research Center.
- n. Sold 1958 Chevrolet Station Wagon on GSA bid for \$50.00.
- o. Purchased Space Ray propane heater (\$72.00).
- p. Received Cold Starting Aid Kit, M-40 (for starting vehicles in low temperatures) from Tooele Army Depot, Tooele, Utah.

B. Plantings

1. Aquatic and Marsh Plants

None this period.

2. Trees and Shrubs

Ten pine trees were planted at Refuge Headquarters and Visitor Center for area beautification. No other trees or shrubs were planted on the refuge during the year.

3. Upland Herbaceous Plants

None this period.

4. Cultivated Crops

Cooperative farmer Harry Prieskorn operated 247 acres this year consisting of Conlon Field, Smith Field, Sub-Headquarters and Chicago Farms. Jay Livermore operated 80 acres of hay at Diversion and Walsh Farms on a cooperative basis with refuge personnel cutting and raking 40 acres.

Refuge personnel operated 90 acres of peatlands, Walsh and Diversion Farms, on the north side of the refuge in addition to the cooperative haying.

Table 15 is a summary of acreages and yields for each crop by farm unit.

Table 15. A Summary Of Acreages And Yields For Each Crop By Farm Unit, Seney Refuge -- 1967

Farm Unit	Hay		Oats w/Seeding		Buckwheat		Rye (planted 1967)		Ripe Rye (planted 1966)	
	Acres	Yield	Acres	Yield	Acres	Yield	Acres	Yield	Acres	Yield
CONLON	20	29 T.	20	700 bu						Cooperators Share Refuge Share
CHICAGO	85 3	153 T. 5 T.			22	550 bu				Cooperators Share Refuge Share
SMITH			26	910 bu						Cooperators Share Refuge Share
SUB-HEADQUARTERS	34	77 T.	9 10	315 bu 350 bu	10 8	250 bu 200 bu				Cooperators Share Refuge Share
DIVERSION	30 30	44 T. 40 T.	19	386 bu	5	84 bu	17	2.5 T.	15	306 bu Refuge Share
WALSH	20	7 T.	10	200 bu	10	0 bu	10	1.5 T.	10	200 bu Cooperators Share Refuge Share
Cooperators Total	169	303 T.	55	1,925 bu	10	250 bu				
Refuge Total	53	52 T.	39	936 bu	45	834 bu	27	4 T.	25	506 bu
GRAND TOTAL	222	355 T.	94	2,861 bu	55	1,084 bu	27	4 T.	25	506 bu

Buckwheat planted late in June did well on all units. Buckwheat planted before June 20 froze out at Diversion and Walsh Farms, while a field at Diversion planted after June 20 did not freeze. Seed from buckwheat combined at sub-headquarters will be used by the refuge and cooperator for planting in 1968. The frozen field of buckwheat at Walsh Farm was later seeded to rye.

Rye was planted at Walsh Farm as mentioned and at Diversion Farm. Wildlife made excellent use of the rye and it is recommended that some rye be planted at each farm unit late in the summer.

Ripe rye was rotary mowed at Walsh and Diversion Farms. The crop was good.

Oats with a seeding of clover and brome was planted on all units except Chicago Farm. Oats were good on the heavier soils and poor to good on the lighter soils. Seedings were poor to good and can be better analysed next spring. Refuge share of oats was rotary mowed on Walsh and Diversion Farms and left standing at Sub-headquarters.

Hay was cut, baled and removed from all farm units. The crop was excellent at sub-headquarters, good at Conlon, Chicago and Diversion Farms and poor at Walsh Farm. Due to light soils and dry conditions the hay at Walsh and Diversion Farms did not come back well and was used very little by wildlife.

Sixteen acres of land were cropped at Diversion Farm for the first time. Ground was initially broken in 1966 and worked down and planted to rye during 1967. An additional four acres were broken by Rome disc in 1967 at Diversion Farm.

The north four acres of field 5 at Walsh Farm were planted to an experimental mixture as was the lower most field at Sub-headquarters. The mixture consisted of: Lincoln Brome, Alsike, Creeping Red Fescue, Chewing Fescue, Perennial Rye Grass, Orchard Grass, Ladino, White Dutch Clover and Bird' Foot Trefoil. Fertilizer was 6-24-24 at the rate of 200 pounds/acre.

C. Collections and Receipts

1. Seed and other propagules

A total of 440 bushel of shelled corn and 144 bushel of ear corn were received from Shiawassee Refuge, to be used to feed the geese during the early spring and as bait for trapping operations.

Fifty bushel of buckwheat were received from the cooperative farmer and will be used as seed for planting during 1968.

2. Specimens

Several specimens, found dead, were used for scientific study and/or saved for exhibit purposes. The list includes the following on hand at Refuge Headquarters: 1 Ruffed Grouse; 1 Canada Goose gosling; 1 Yellow-shafted Flicker; 1 Ring-necked Duck; 1 Red Fox; 2 Canada Geese; and 1 Mink. The list also includes the following specimens donated to Michigan Technological University: 1 Coyote; 1 Barred Owl; 1 Canada Goose; 1 Herring Gull; 2 Mallards; 1 Black Duck; 3 Blue-winged Teal; 3 Mink; 1 Horned Lark; and 2 Soras.

D. Control of Vegetation

The main effort was directed against trees and shrubs on safe goose nesting islands and along refuge roads. All safe goose nesting islands in C-2, A-2 and part of C-3 Pool were cleared of brush. Tag alder stumps on some of the C-2 islands were sprayed with a 2-4-D and 2-4-5-T mixture. Roads cleared of brush and overhanging trees include: Riverside Dike Road, Sweeney Pool Road, Pine Creek Road and part of the Guided Auto Tour Route.

E. Planned Burning

On October 6 Manager Wilbrecht and Biologist Updike assisted the Michigan Department of Conservation with a controlled burn of one section for the development of Sharp-tailed Grouse habitat north of M-28, 1½ miles north of the refuge boundary. The Michigan Department of Conservation aerial sprayed vegetation bordering the refuge boundary north of compartment 4. The Conservation Department had planned to burn the sprayed area in the fall but a long wet spell made burning impossible.

The refuge and the Conservation Department have a cooperative agreement regarding controlled burns for Sharp-tail Grouse on Refuge lands and State lands adjacent to the north boundary of the refuge.

F. Fires

1. Statistical Fires

One fire occurred on the refuge this period requiring effort by the refuge staff for suppression. On July 27 the Michigan Department of Conservation reported a fire on the refuge after a severe electrical storm. The fire was spotted by the Department's aircraft as it flew over the area. If it had not been for the aircraft the fire probably would not have been detected until it was more serious. The fire was located in Section 33, T45N, R13W in the proposed String Bog Wilderness

Area. Access was extremely difficult requiring about 80% of the total man hours to travel to and from the fire. Four men spent a total of six man hours at the fire scene mopping up. A total of 1.5 acres were burned requiring 82 man hours to suppress at a cost of \$393.16. There was no serious loss of timber as a result of the fire.

On June 3 the refuge was called by the Michigan Department of Conservation in accordance with the cooperative fire protection agreement to assist with a fire at the Grand Marais Dump, about 30 miles north of the refuge, which was threatening to spread to a stand of Jack Pine. Manager Hakala, Wildlife Biologist Updike, Mechanic Orlich, Maintenceman Losey and seasonal employee Zellar and three vehicles were dispatched. The fire was undercontrol when refuge personnel arrived and they returned to the refuge. This fire cost the refuge \$92.19.

2. Protection

The Fire Protection Plan was updated including a revision of the duty roster.

Additional fire suppression tools and equipment were acquired for the fire cache and fire boxes to meet needs outlined in the Fire Protection Plan.

The Cooperative Fire Protection Agreement between the Seney Refuge and The Michigan Department of Conservation was renewed again this year. Under the Cooperative Forest Fire Agreement with the State the refuge also can receive help suppressing fires on refuge lands if requested.

3. Fire Weather

Fire danger remained low except for a period in September. Fire danger records were maintained from April 17 to November 10 and portray the following:

<u>Fire Danger</u>	<u>Days</u>	<u>Spread Index</u>
Low	105	0-4
Moderate	50	5-9
High	36	10-19
Very High	10	20-39
Extreme	0	40-100

During the latter part of August and the month of September, ground cover became brown and very dry. It was fortunate that there were not more fires as there were some thunder storms.

With rains falling at the right time and with fast initial attack forces, the State of Michigan forest fire season ended with damage held to an all-time low since 1871 when record keeping began.

The refuge receives help in detecting fires from the Michigan Department of Conservation as the Department patrols the refuge with aircraft as they fly over adjacent State lands.

IV. RESOURCE MANAGEMENT

A. Grazing

None this period.

B. Haying

Hay is an important crop at Seney for providing badly needed mulch and green goose forage in late summer.

Cooperative farmer Prieskorn harvested 142 acres of hay consisting of 10,577 bales with a total weight of 264 tons (average 50#/bale). The refuge share of 5 tons (200 bales) was spread along the improved Pine Creek Road during August.

There were 80 acres of hay at the Walsh and Diversion Farms. Cooperator Jay Livermore cut and raked 40 acres and baled all 80 acres for 50% of the crop. Yield was 4,555 bales or 91 tons (40#/bale). The refuge share, 47 tons, was used to mulch sand blows on C-3 dike; along Driggs, Walsh and Pine Creek Roads; and on Quarters #1, #136 and the office lawns.

Hay on the Walsh Farm was too light to have been cut and should have been rotary mowed.

C. Fur Harvest

An intensive animal control program was carried out this year by one permittee trapper, the Division of Wildlife Services and refuge personnel. In April Norm Johnson and Richard Wetzell of the Division of Wildlife Services spent a week at Seney instructing refuge personnel and setting steel traps. Refuge personnel set out live traps and maintained trap lines throughout the summer.

In July Cameron Coe of Manistique was issued a permit for taking predators on the refuge. He was allowed to keep 100% of his catch. Mr. Coe was also issued a permit to trap mink in the fall near duck banding sites. The mink was divided on a 50-50 basis.

A total of 28 muskrat, 16 mink, 12 striped skunks, 48 raccoons,

24 coyotes, 14 porcupines, 10 red fox and 3 bobcats were removed as a result of all trapping efforts. Muskrat fur brought \$0.65 per hide and mink \$3.50 per female and \$7.00 per male. The refuge share consisting of 14 muskrat and 8 mink furs brought \$47.15.

D. Timber Removal

No major sales occurred on the refuge this period. Mr. Harold Peters' performance bond of \$75.00 for the Grey Creek Timber Sale was forfeited last June due to unsatisfactory compliance of contract specifications, after three extensions of his permit. Merle Anderson was given the job of cleaning the sale area up. The clean-up work consisted mainly of cutting down, leaning, tree tops and cutting spring poles.

Approximately 20 cords of Jack Pine and Black Spruce were removed from along the entrance road by Lawrence Zellar during October. This timber fell down in the fall of 1966 during a wet snow storm accompanied by high winds. Mr. Zellar performed the job as a service to the refuge, taking the timber for payment.

No major timber sales are planned on the refuge until the Forest Land Use Plan is completed.

E. Commercial Fishing

None at this refuge.

F. Other Uses

Mr. Stanley Tyner of Shingleton, Michigan was granted a Special Use Permit to load forest products at the Walsh railroad siding (Spur 91), from June 29 through December 31. Under this permit 20 cars of cull logs, equivalent to 80 truck loads, were loaded. An additional 40 truck loads of cull logs were on the landing as of December 1. A truck load is equal to 5 cords with a car holding 20 cords. Mr. Tyner did not report on his December activities.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Waterfowl Disease Study (Leucocytozoon)

Dr. James Barrow of Hiram College, Ohio, completed five years of data gathering in September of 1963. To date no publication or completion report has been received.

B. Blackfly Study

Dr. Carlton M. Herman of the Patuxent Wildlife Research Center has

been supervising this study. He made a trip to Seney in July and obtained blood samples from 50 Canada Geese during the drive trapping program. This study is aimed at the blood diseases Plasmodium and Leucocytozoon, but deals primarily with the vector of the disease. Dr. I. Barry Tarshis of Patuxent was the field investigator in 1967, with William A. Neill of Hiram College his assistant. Through Dr. Tarshis, Patuxent is trying to determine which species is the vector and how it may be controlled.

Dr. Tarshis expanded his work considerably and made some excellent gains during his April 15 - June 28 stay at Seney. Refuge personnel collected 498 individual birds representing 18 species for blood samples and exposing to blackflies. The Crow represents a reservoir of blood diseases transmitted by blackflies. Pools, rivers and marshes were searched for blackfly larvae. One species of blackfly, not found in the larvae form before, was located on sunken logs in the Manistique River. Larvae were collected for rearing in the lab. Several logs, with cables attached, were placed in the river for larvae collection in 1968. Nearly 100 goslings were captured during June and July and all were positive for the blood disease Leucocytozoon. Blackflies were collected by refuge and research personnel for identification in the lab. Several domestic ducks and geese were placed in pens throughout Unit I. Blood smears were taken daily and blackflies were collected from the birds. The various stages of blood disease were followed in the domestic birds.

Dr. Tarshis again plans to return to Seney in the spring of 1968 for an extended period. This was the fifth consecutive year of this study.

C. Land Use Planning

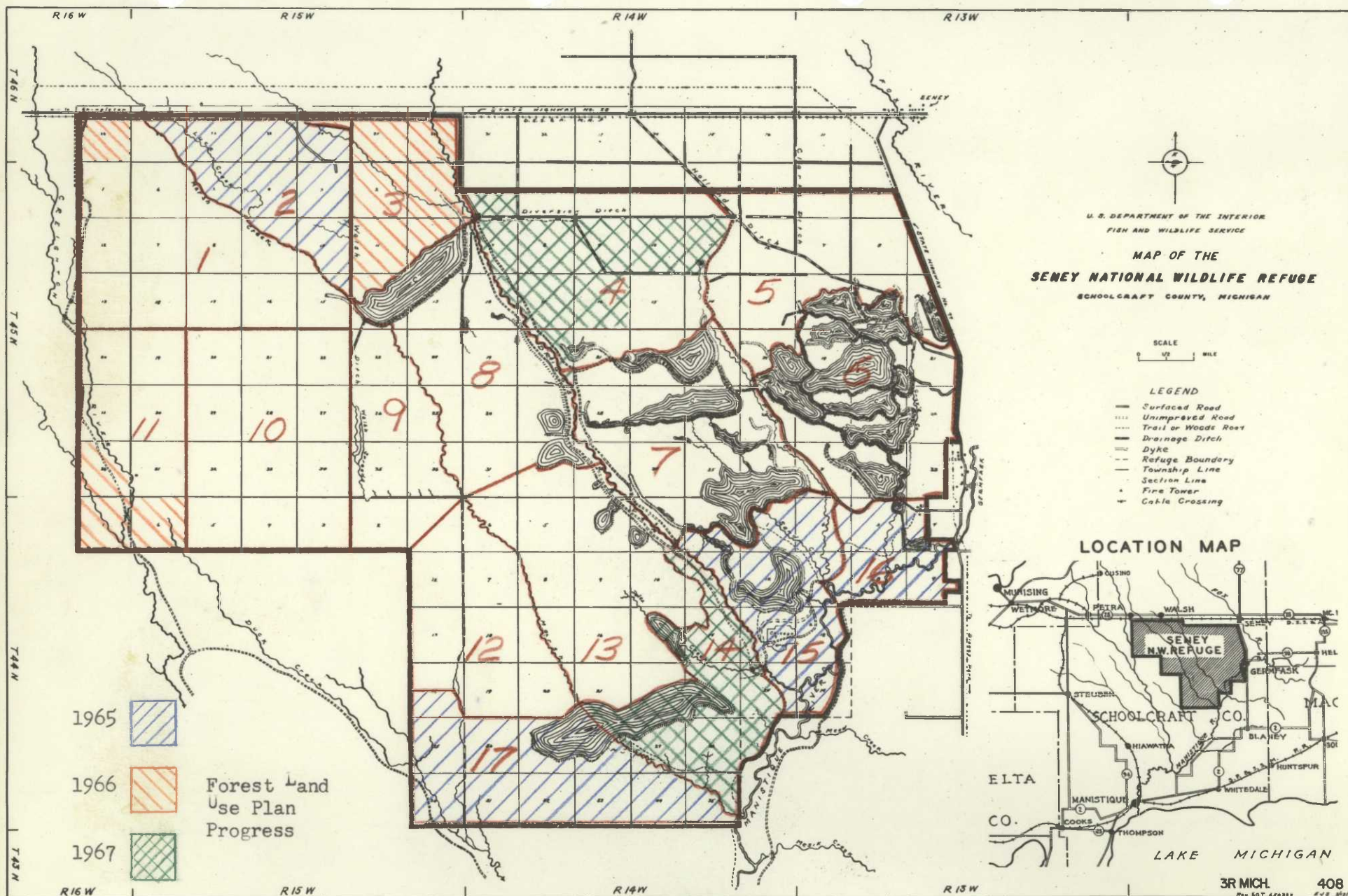
In 1965 an intensive inventory of Seney's habitat types was initiated. Thirty-two thousand, four-hundred fifty-three (32,453) acres have been inventoried to date. Eight thousand, one-hundred nineteen (8,119) acres were inventoried this year. A Land Use Plan will be prepared when the inventory is complete. At the present rate the inventory should be completed by the fall of 1969.

D. Pesticide Study

In 1966 Richard L. Moore and Carl E. Carlson from the U.S. Department of Agriculture, Lansing, Michigan, established permanent study plots in the Red Pine Natural Area for the purpose of pesticide study and surveillance. Although soil core samples were to be taken annually, neither of the men appeared during 1967.

E. Student Assistant Projects

Each college student was assigned a field research project. A



listing of student projects is given under Seasonal Personnel, Section VII, and a summary statement of each is presented under its appropriate subject, with the following exception on forestry.

Local Jack Pine Yield Table

Forestry Aid Larry Strecker constructed a Local Jack Pine Yield Table for his summer project. The work consisted of locating Jack Pine stands from Forest Land Use Plan cards. Data were limited to medium site and 40-60 year old age class as there is not enough Jack Pine on the refuge in other sites and age classes to obtain sufficient data for a yield table.

The project consisted of taking sample plots of 1/5 acre in different stands of the refuge to obtain all variances of the stands. All trees on the 1/5 acre plots were measured for diameter at DBH, and merchantable height. Some trees on each plot were bored with an increment borer to find the average age. At least one tree was cut on each plot and the following data obtained; diameter - breast height; age; stump height; total height; height to 4" d.l.b.; and the diameter at each 16' length to determine taper in stem. Eleven plots were taken with a total of 434 trees.

A Yield Table was constructed from the data obtained. The local yield table should prove valuable in obtaining volumes for future Jack Pine sales and in the economic management of the stands. The form class of the merchantable Jack Pine was also calculated from data obtained.

VI. PUBLIC RELATIONS

A. Recreational Uses

In contrast to the good tourist season experienced by the Upper Peninsula last year, 1967 was widely disappointing. Much of the drop could be attributed to a cool summer, a wet fall and the economic impact of the long auto strikes. Total visits to the refuge this year were 63,641, a drop of nearly 10,000 or 14%, compared to the 73,618 for 1966. Interestingly, the Michigan Tourist Council and the Michigan Department of Conservation estimate tourist business in the Upper Peninsula off 15% from the normal based on Mackinac Bridge traffic and other indices.

We estimate fishing use increased from 3,828 visits last year to 5,409 in 1967. A drop of over 30% was recorded in deer hunter numbers (2,760 this year compared to 4,089 in 1966). This drop in hunter use could probably be attributed to the concurrent opening of the deer season in both Lower and Upper Michigan in contrast to separate opening days the last several years. However, some deer

hunters indicated that due to the auto strike and its subsequent settlement many hunters had difficulty getting vacations for the deer season.

Another area of use recording needing further explanation is the Official and Economic visits which recorded 1,518 this year compared to 4,398 in 1966; a drop of 2,880. In the past it had been the practice to include traffic utilizing certain public trails and roads (for logging, hauling, etc.) passing through the refuge. Unless this use is directly related to sale of refuge products, this will no longer be counted.

Sales of permits under the Land and Water Conservation Fund were off as indicated in the following table. Permits are required only for the tours. This is our second year under the fee system.

Table 16. Number of Land and Water Conservation Fund Permits Sold -- Revenue and Collection Costs

Year	\$7.00 Golden Eagle	\$1.00 Daily	\$0.50 Individual	Total Revenue	Administrative Expenses
1966	38	1,451	20	\$1,727.00	?
1967	30	1,390	9	\$1,604.50	\$1,912.39

The tours remain popular with the Self-Guided showing an increase while the evening Guided Tour number fell off. Table 17 compares the past years' use of the tours.

Table 17. Comparison In Tours At Seney Refuge.

Year	Self-Guided		Evening Guided		Total People
	Cars	People	Cars	People	
1967	965	3,851	638	2,734	6,585
1966	963	3,413	795	3,310	6,723
1965	1,083	4,283	784	3,423	7,706
1964	621	2,755	683	3,041	5,796
1963	?	955 *	?	3,675	4,630
1962			?	4,370	4,370
1961			?	3,203	3,203

* Run one month only

Use of the Driggs Picnic Area along Highway M-28 on the north boundary and the Wigwam Area on Highway M-77 near headquarters continues high with an estimated 17,600 visits compared to 17,116 picnickers last year.

Vandalism remains a minor problem although some "nature lover" using the walking Nature Trail destroyed several of the metal signs and carved initials in several wooden displays.

Number of groups utilizing the Visitor Center showed a big decrease: 33 groups with 1,327 people in 1966 compared to 10 groups with 864 people this year. We attribute this to extremely poor weather during National Wildlife Week with snow and storms of the 1967 spring making it nearly impossible to use the facility.

Generally, the interpretive portion of our Recreation Program is being well accepted by the public. With the addition of an Interpretive Specialist (Assistant Manager) in 1968 we hope to improve our contacts and overall approach to interpretation and Conservation Education here at Seney.

B. Refuge Visitors

Official refuge visitors are listed on pages 31 through 35.

OFFICIAL VISITORS

<u>Date</u>	<u>Name and Title</u>	<u>Address</u>	<u>Representing</u>
01-12-67	E.J. "Shine" Sundstrom, Editor	Sault Ste. Marie, Mich.	Soo Evening News
01-25-67	Charlie J. Doonan	Escanaba, Michigan	U.S. Geological Survey
01-25-67	Larry Hough, Engineer	Escanaba, Michigan	U.S. Geological Survey
01-26-67	Donald L. Thurlow, Instructor	Marquette, Michigan	Michigan State University
01-26-67	Dean Rhoads, County Extension Agent	Manistique, Michigan	Michigan State University
01-30-67	Dr. John H. Tanton	Petoskey, Michigan	Wilderness Hearings
02-01-67	William Aultfather, Regional Forester	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
02-01-67	Les Dundas, Staff Specialist	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
02-06-67	Rex Beadle, Radio Engineer	Newberry, Michigan	Michigan Conservation Department
02-16-67	John L. Oberg, Engineer Technician	Escanaba, Michigan	U.S. Geological Survey
02-16-67	Larry Hough, Engineer	Escanaba, Michigan	U.S. Geological Survey
02-23-67	Dr. Norman F. Sloan, Instructor	Houghton, Michigan	Michigan Technological University
03-06-67	John L. Zimmerman, Conservation Officer	Newberry, Michigan	Michigan Conservation Department
03-06-67	Alex McLean, Conservation Officer	Newberry, Michigan	Michigan Conservation Department
03-07-67	E.J. "Shine" Sundstrom, Editor	Sault Ste. Marie, Mich.	Soo Evening News
03-08-67	John Winship, Pilot-Biologist	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
03-08-67	Leland Anderson, Fishery Biologist	Newberry, Michigan	Michigan Conservation Department
03-14-67	William Chreistie	Glasgow, Scotland	Michigan State University
03-14-67	Dean Rhoads, County Extension Agent	Manistique, Michigan	Michigan State University
03-16-67	Stanley Baldwin, Field Aid	Lansing, Michigan	U.S. Weather Bureau
03-22-67	James Walton, Highway Engineer	Lansing, Michigan	State of Michigan
03-29-67	John Oberg, Engineer Technician	Escanaba, Michigan	U.S. Geological Survey
03-29-67	Richard R. Eagle, Field Aid	Gladstone, Michigan	U.S. Geological Survey
03-29-67	Bill Briggs, Sanitation Engineer	Manistique, Michigan	Alger-Schoolcraft Health Dept.
03-29-67	Ronald Starine, Engineer Aid	Manistique, Michigan	Alger-Schoolcraft Health Dept.
03-30-67	Bruno Lunfor	Munising, Michigan	U.S. Forest Service
03-30-67	Floyd N. Roberts, District Ranger	Munising, Michigan	U.S. Forest Service
04-03-67	Richard S. Wetzel	Lansing, Michigan	Division of Wildlife Services
04-03-67	Norman C. Johnson	St. Paul, Minnesota	Division of Wildlife Services
04-04-67	Robert Pintal	Carp Lake, Michigan	Michigan Conservation Department
04-04-67	Bill Briggs, Sanitation Engineer	Manistique, Michigan	Alger-Schoolcraft Health Dept.
04-04-67	Ronald Starine, Engineer Aid	Manistique, Michigan	Alger-Schoolcraft Health Dept.

<u>Date</u>	<u>Name and Title</u>	<u>Address</u>	<u>Representing</u>
04-05-67	Ray Salo, Game Biologist	Manistique, Michigan	Michigan Conservation Department
04-06-67	Larry Hough, Engineer	Escanaba, Michigan	U.S. Geological Survey
04-06-67	Jerry Peterson, Fishery Aid	Newberry, Michigan	Michigan Conservation Department
04-06-67	Lloyd Martindale, Fishery Aid	Newberry, Michigan	Michigan Conservation Department
04-06-67	Dr. Gordon A. Eadie, M.D.	Newberry, Michigan	Alger-Schoolcraft-Luce-Mackinac Health Department
04-11-67	Roger Howell	Manistique, Michigan	Soil Conservation Service
04-16-67	Dr. John Tanton, M.D.	Petoskey, Michigan	Wilderness Hearings
04-20-67	E.J. "Shine" Sundstrom, Editor	Sault Ste. Marie, Mich.	Soo Evening News
04-27-67	Ralph Bailey, District Game Biologist	Marquette, Michigan	Michigan Conservation Department
04-28-67	M. Rupert Cutler	Washington, D.C.	The Wilderness Society
05-09-67	Douglas Turim	Marquette, Michigan	Branch Prison
05-09-67	Pat Ellsworth	Marquette, Michigan	Branch Prison
05-10-67	Richard R. Eagle, Field Aid	Gladstone, Michigan	U.S. Geological Survey
05-10-67	Miss Rose LaChapalle, Reporter	Manistique, Michigan	Escanaba Daily Press
05-11-67	R.C. Chase, Forest Supervisor	Rapid River, Michigan	U.S. Forest Service
05-11-67	Robert Lannan, Forester	Rapid River, Michigan	U.S. Forest Service
05-11-67	Bill Fossum, Forester	Rapid River, Michigan	U.S. Forest Service
05-11-67	Peter Adams, Forester	Rapid River, Michigan	U.S. Forest Service
05-11-67	George E. McLaughlin, Forester	Rapid River, Michigan	U.S. Forest Service
05-15-67	Richard P. Brude	New Haven, Conn.	Yale University
05-15-67	Pete A. Jordan	New Haven, Conn.	Yale University
05-22-67	Lloyd A. Maples, UDS Officer	Chicago, Illinois	General Services Administration
05-22-67	Gerald Falls, UDS Officer	Detroit, Michigan	General Services Administration
05-24-67	Harold Green	Ann Arbor, Michigan	Bureau of Outdoor Recreation
05-25-67	Gordon Feil	Philadelphia, Pa.	National Parks Service
05-25-67	Robert Carpenter	Philadelphia, Pa.	National Parks Service
05-25-67	Art Beyer	Philadelphia, Pa.	National Parks Service
05-25-67	Carl P. Schreiber	Philadelphia, Pa.	National Parks Service
06-06-67	Edmond L. Doeling, Engineer	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
06-07-67	John Ash, Engineer	Lansing, Michigan	U.S. Geological Survey
06-07-67	Gordon Hulbert, Engineer	Escanaba, Michigan	U.S. Geological Survey
06-09-67	Ralph Bailey, District Game Biologist	Marquette, Michigan	Michigan Conservation Department

<u>Date</u>	<u>Name and Title</u>	<u>Address</u>	<u>Representing</u>
06-14-67	Jane Obermeyer, Naturalist	Milford, Michigan	Kensington Metropolitan Park
06-14-67	Pat Eising, Naturalist	Romeo, Michigan	Stoney Creek Nature Center
06-18-67	Dr. Miles D. Pirnie	E. Lansing, Michigan	Michigan State University
06-19-67	William Aultfather, Regional Forester	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
06-22-67	May Donald	Milwaukee, Wisconsin	Wisconsin Society of Ornithology
06-22-67	Mary E. Decker	Milwaukee, Wisconsin	Wisconsin Society of Ornithology
06-22-67	Karl Priebe, Artist	Milwaukee, Wisconsin	Milwaukee Journal
06-23-67	William Taylor, Biologist	Escanaba, Michigan	U.S. Forest Service
06-26-67	Fred Steiner	Marquette, Michigan	Operation Action, Upper Peninsula
06-26-67	Gordon Schoeneweg, Foreman	Detroit, Michigan	Detroit-Edison Company
06-27-67	Clair Rollings, Staff Specialist	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
06-27-67	John Winship, Pilot-Biologist	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
07-07-67	Robert Odom	Gladwin, Michigan	Michigan Conservation Department
07-07-67	Dr. Carlton M. Herman	Laurel, Maryland	Patuxent Wildlife Research Center
07-07-67	Charles Lavender, Superintendent	Newberry, Michigan	Luce County Road Commission
07-13-67	Frank B. McGilivey, Biologist	Laurel, Maryland	Patuxent Wildlife Research Center
07-13-67	Dr. William E. Green, Biologist	Winona, Minnesota	U.S. Fish and Wildlife Service
07-17-67	Dr. Robert L. Meeks (Former Seney Student)	Port Clinton, Ohio	Ohio State University
07-17-67	Tom Smith	Stony Creek, Michigan	Huron Clinton Metropolitan Authority
07-19-67	Ake Aronsson	Ymerg, Uppsala, Sweden	Uppsala University, Sweden
07-19-67	Dean Rhoads, County Extension Agent	Manistique, Michigan	Michigan State University
07-19-67	Rex Beadle, Radio Engineer	Newberry, Michigan	Michigan Conservation Department
07-21-67	John Carney	Washington, D.C.	VISTA
07-21-67	Edward G. Voss, Wildlife Instructor	Ann Arbor, Michigan	University of Michigan
07-21-67	John S. Russell	Ann Arbor, Michigan	University of Michigan
07-21-67	Gary Williams	Ann Arbor, Michigan	University of Michigan
07-27-67	Richard R. Eagle, Field Aid	Gladstone, Michigan	U.S. Geological Survey
07-27-67	Dr. George S. Hunt, Instructor	Ann Arbor, Michigan	University of Michigan
07-27-67	Gordon C. Hulbert, Engineer in Charge	Escanaba, Michigan	U.S. Geological Survey
08-01-67	Lawrence Smith, Manager	Bascom, New York	Iroquois National Wildlife Refuge
08-01-67	Stanley Baldwin, Field Aid	E. Lansing, Michigan	U.S. Weather Bureau
08-02-67	Dr. Edward G. Voss, Associate Professor	Ann Arbor, Michigan	University of Michigan
08-04-67	William Fuchs, State Supvr. GMA	Lansing, Michigan	U.S. Fish and Wildlife Service

<u>Date</u>	<u>Name and Title</u>	<u>Address</u>	<u>Representing</u>
08-10-67	Sergej Postupalsky	Royal Oak, Michigan	Michigan Audubon Society
08-12-67	Vern Rudolph, Clerk	Necedah, Wisconsin	Necedah National Wildlife Refuge
08-15-67	Mac Frimadig, Supvr. Parks & Rec.	Marquette, Michigan	Michigan Conservation Department
08-16-67	John W. Hines	Columbus, Ohio	Ohio State University
08-18-67	Bainet W. Schianck	Princeton, Minnesota	Sherburne Nat'l Wildlife Refuge
08-21-67	Rex Beadle, Radio Engineer	Newberry, Michigan	Michigan Conservation Department
08-31-67	Richard Wetzel	Lansing, Michigan	Division of Wildlife Services
09-05-67	Dr. J.J. Shomon, Nature Center Planner	New York, New York	National Audubon Society
09-05-67	R.F. Holmes, Nature Center Planner	New York, New York	National Audubon Society
09-05-67	William Aultfather, Regional Forester	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
09-06-67	Ray Salo, Game Biologist	Manistique, Michigan	Michigan Conservation Department
09-08-67	T.E. Kangas, F.C.C. Engineer	St. Paul, Minnesota	Federal Communications Commission
09-11-67	Yozo & Yoshiko Tsukamoto	Tokyo Japan	Japanese Proposed Conservation Department
09-11-67	Loren Berndt, Soil Scientist	Marquette, Michigan	Soil Conservation Service
09-11-67	Roger Howell	Manistique, Michigan	Soil Conservation Service
09-11-67	Erwin Simi	Ontonagon, Michigan	Soil Conservation Service
09-12-67	Donald R. Wiertella	McMillan, Michigan	State Highway Department
09-12-67	Paul Michelin	Newberry, Michigan	State Highway Department
09-12-67	Charles Stone, Biologist	Columbus, Ohio	U.S. Fish and Wildlife Service
09-12-67	Wakelin McNeal Jr., Assoc. Professor	Mt. Pleasant, Michigan	Central Michigan University
09-13-67	Gerald Falls, UDS Officer	Detroit, Michigan	General Services Administration
09-14-67	Bill Briggs, Sanitation Engineer	Manistique, Michigan	Alger-Schoolcraft Health Dept.
09-20-67	Dr. G.A. Ammann, Biologist	Lansing, Michigan	Michigan Conservation Department
09-22-67	Ray R. Vaughn	Minneapolis, Minnesota	Division of Fish Hatcheries
09-22-67	Fred J. Howard	Washington, D.C.	Division of Fish Hatcheries
09-26-67	Rose LaChapelle, Reporter	Manistique, Michigan	Esplanada Daily Press
09-28-67	Chuck Griffith, Con.-Educ. Officer	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
09-28-67	Joseph Knecht, Engineer	Minneapolis, Minnesota	U.S. Fish and Wildlife Service
10-04-67	Jack Van Coevering, Natural Resources	Ann Arbor, Michigan	University of Michigan
10-10-67	Leo E. Thorson, Dept. of Surgery	Stoughton, Wisconsin	University of Wisconsin
10-12-67	Howard H. Handorf, Coop. Ext. Service	Manistique, Michigan	Michigan State University
10-13-67	Herbert J. Miller	Lansing, Michigan	Michigan Conservation Department

<u>Date</u>	<u>Name and Title</u>	<u>Address</u>	<u>Representing</u>
10-13-67	C.A. Gorham & wife	Rainy River, Ontario	Canada Ducks Unlimited
10-15-67	Jerry L. Chiappetta	Birmingham, Michigan	WXYZ - TV, Detroit
10-16-67	Andrew J. Meyers, Ass't Reg. Director	Minneapolis, Minnesota	Bureau of Sport Fisheries & Wildlife
10-17-67	John Winship, Pilot-Biologist	Minneapolis, Minnesota	Bureau of Sport Fisheries & Wildlife
10-20-67	Ralph E. Bailey, Game Biologist	Marquette, Michigan	Michigan Conservation Department
10-30-67	E.J. "Shine" Sundstrom, Editor	Sault Ste. Marie, Mich.	Soo Evening News
10-31-67	Rex Beadle, Radio Engineer	Newberry, Michigan	Michigan Conservation Department
11-02-67	Larry Hough, Engineer	Escanaba, Michigan	U.S. Geological Survey
11-02-67	Charles J. Doonan	Escanaba, Michigan	U.S. Geological Survey
11-06-67	Harris Miller	Sault Ste. Marie, Mich.	Federal Bureau of Investigation
11-06-67	Clyde Gravin	Marquette, Michigan	Federal Bureau of Investigation
11-14-67	Lou Verme, In Charge	Shingleton, Michigan	Michigan Conservation Department
12-01-67	Ralph Wall, Professor	Ann Arbor, Michigan	University of Michigan
12-01-67	Jacob B. Keller, Professor	Ann Arbor, Michigan	University of Michigan
12-01-67	Donald Powers, Professor	Ann Arbor, Michigan	University of Michigan
12-07-67	Ralph E. Bailey, Game Biologist	Marquette, Michigan	Michigan Conservation Department

FREQUENT VISITORS TO REFUGE DURING 1967

Richard C. Branzell, GMA	Escanaba, Michigan	U.S. Fish and Wildlife Service
Leslie Walstrom, Conservation Officer	Curtis, Michigan	Michigan Conservation Department
Walt Niemi, Fire Officer	Seney, Michigan	Michigan Conservation Department
John Mattson, Fire Officer	Grand Marais, Michigan	Michigan Conservation Department
Lloyd Schemenauer, Game Biologist	Newberry, Michigan	Michigan Department of Conservation
Leland Anderson, Fish Biologist	Newberry, Michigan	Michigan Department of Conservation
Dr. I. Barry Tarshis, Parasitologist	Laurel, Maryland	Patuxent Wildlife Research Center
Cameron N. Coe, Predator Trapper	Manistique, Michigan	
Harry Prieskorn, Cooperative Farmer	Germfask, Michigan	
Laverne Macaulay, Cooperative Farmer	Germfask, Michigan	

C. Refuge Participation

Following is a list of public contacts, conferences, etc.

<u>Date</u>	<u>Group Title</u>	<u>No. In Party</u>	<u>Personnel Involved</u>
01-10-67	Schoolcraft County Soil Conservation Service District Annual Meeting and Banquet, Gulliver, Michigan. Manager Hakala presented slide talk on Reindeer Herd in Alaska (North of Artic Circle) -- Off Refuge	95	Hakala
02-06-08-67	Michigan Canada Goose Seminar, Kensington Metropolitan Park, Milford, Michigan -- Off Refuge	22	Hakala Udike
02-08-67	Resource Managers Meeting, Cusino Wildlife Research Station, Shingleton, Michigan -- Off Refuge	45	Halladay
02-09-67	Upper Peninsula Law Enforcement Association, Munising, Michigan -- Off Refuge	75	Hakala
02-15-18-67	Refuge Clerk Workshop, Minneapolis, Minnesota -- Off Refuge	50	Doran
02-16-67	Farmers Meeting, Engadine, Michigan -- Off Refuge	33	Hakala
02-20-03-10-67	Recreation Workshop, Washington, D.C. -- Off Refuge		Halladay
02-23-67	Wildlife Meeting (Extension Service Michigan State University), Germfask, Michigan -- Off Refuge	19	Udike Orlich
02-27-67	Seminar, Michigan State University, East Lansing, Michigan -- Off Refuge	40	Hakala Frye
02-28-67	Student Interviews, Michigan State University, East Lansing, Michigan -- Off Refuge	30	Hakala Frye
02-28-67	Seminar, University of Michigan, Ann Arbor, Michigan -- Off Refuge	30	Hakala Frye
02-28-67	Student Interviews, University of Michigan, Ann Arbor, Michigan -- Off Refuge	15	Hakala Frye

<u>Date</u>	<u>Group Title</u>	<u>No. In Party</u>	<u>Personnel Involved</u>
03-08-67	Michigan Public Policy Workshop, Food For Freedom, Engadine, Michigan -- Off Refuge	30	Hakala
03-13-67	Fisheries and Wildlife Seminar, Land Management Problems, University of Michigan, Ann Arbor, Michigan -- Off Refuge	27	Hakala
03-13-67	Schoolcraft Soil Conservation District Manistique, Michigan -- Off Refuge	6	Halladay
03-15-67	Michigan Public Policy Workshop, County Government, Engadine, Michigan -- Off Refuge	35	Hakala
03-16-67	Radio Interview (WGON), Minising, Michigan -- Off Refuge		Hakala
03-22-67	Michigan Public Policy Workshop, Engadine, Michigan -- Off Refuge	33	Hakala Halladay
03-23-67	Contemperary History (12th Grade) Manistique High School, Manistique, Michigan -- Off Refuge	60	Hakala
03-23-67	Munising Public Schools, High School Biology Class, Munising, Michigan -- On Refuge	50	Halladay
03-23-67	Mueller Public School (Grade 1, 2 & 3) Gulliver, Michigan -- On Refuge	60	Halladay
03-28-67	Michigan State University Extension Service (Land Use, The Linall Land Owner), Newberry, Michigan -- Off Refuge	40	Hakala
03-29-67	Michigan Islands Wilderness Study Public Hearing, Petoskey, Michigan -- Off Refuge	15	Hakala
03-30-67	Fire Control Meeting (U.S. Forest Service and Michigan Department of Conservation), Newberry, Michigan -- Off Refuge	45	Hakala

<u>Date</u>	<u>Group Title</u>	<u>No. In Party</u>	<u>Personnel Involved</u>
04-04-67	Michigan State University Extension Service (Land Use and the Small Land Owner), Newberry, Michigan -- Off Refuge	33	Hakala Updike
04-07-67	Assistant U.S. District Attorney (U.S. Commissioners Court), Marquette, Michigan -- Off Refuge	5	Hakala Halladay GMA Branzell
04-11-67	Michigan State University Extension Service (Land Use and the Small Land Owner), Newberry, Michigan -- Off Refuge	22	Hakala
04-13-67	Upper Peninsula Law Enforcement Association, Iron River, Michigan -- Off Refuge	100	Hakala
04-17-67	Manistique Rotary Club, Manistique, Michigan -- Off Refuge	40	Hakala
04-18-67	Women's Club, Curtis, Michigan -- Off Refuge	55	Hakala
04-18-67	Michigan State University Extension Service (Land Use and the Small Land Owner), Newberry, Michigan -- Off Refuge	40	Halladay
04-21-67	Teen-Nite (local youth group) Germfask School, Germfask, Michigan -- Off Refuge	39	Halladay
04-25-67	Top O'Lakes Chamber of Commerce, Manistique, Michigan (Guidelines for Growth) Report on Tourism -- Off Refuge	120	Hakala
05-08-67	Northern Michigan University Ecology Class, Marquette, Michigan -- On Refuge	46	Halladay
05-12-67	Rock High School Biology Class, Rock, Michigan -- On Refuge	20	Halladay
05-13-67	Marquette Audubon Chapter of Michigan Audubon Society, Marquette, Michigan -- On Refuge	15	Halladay
05-15-67	Yale University Forest Ecology Class New Haven, Conn. -- On Refuge	4	Halladay

<u>Date</u>	<u>Group Title</u>	<u>No. In Party</u>	<u>Personnel Involved</u>
05-22-67	Curtis Elementary School, Curtis, Michigan -- On Refuge	50	Halladay
05-22-67	Schoolcraft County Board of Supervisors, Manistique, Michigan -- Off Refuge	100+	Hakala
05-26-67	Germfask Elementary School, Germfask, Michigan -- On Refuge	110	Halladay Doran
06-01-67	Mellen School, Wallace, Michigan -- On Refuge	80	Doran
06-06-67	U.S. Geological Survey, Regional Engineer and Refuge Personnel Meeting on Water Problems -- On Refuge	6	Hakala Updike Hubbard
06-16-67	Manistique Public Schools, Manistique, Michigan -- On Refuge	98	Updike Early
06-20-67	Brimley Public Schools, Brimley, Michigan -- On Refuge	40	Updike
07-10-67	Soil Conservation Service, Manistique, Michigan -- Off Refuge	3	Hakala
07-14-67	Newberry Public Schools (2nd Grade), Newberry, Michigan -- On Refuge	27	Early
07-20-67	Radio Interview, Munising Radio (WGON) Munising, Michigan -- Off Refuge		Hakala
07-21-67	4-H Group, Chatham, Michigan -- On Refuge	155	Updike Hubbard Early Strawe
07-24-67	Woodcock Banding Session, Pigeon River, Michigan -- Off Refuge	17	Updike
07-26-67	University of Michigan Wildlife Class, (Dr. Hunt's Group from Iron River) Ann Arbor, Michigan -- On Refuge	16	Hakala Updike Early Strawe
08-02-67	Dr. Voss, University of Michigan, (Aquatic Plant Class from Pellston) Ann Arbor, Michigan -- On Refuge	11	Doran

<u>Date</u>	<u>Group Title</u>	<u>No. In Party</u>	<u>Personnel Involved</u>
08-31-67	Germfask School Recreation Class, Germfask, Michigan -- Off Refuge	21	Updike
10-07-67	Michigan Technological University, Houghton, Michigan (Wildlife Class) -- On Refuge	31	Wilbrecht Updike
10-17-67	State Trapping Regulation Meeting, Michigan Department of Conservation, Escanaba, Michigan -- Off Refuge	16	Updike
10-17-67	Germfask Elementary School (On a leaf collection trip), Germfask, Michigan -- On Refuge	23	Wilbrecht
11-24-67	Germfask School Recreation Class, Germfask, Michigan -- Off Refuge	29	Doran
12-01-67	Germfask School Recreation Class, Germfask, Michigan -- Off Refuge	32	Doran
12-08-67	Germfask School Recreation Class, Germfask, Michigan (film on Woodcock shown) -- Off Refuge	26	Doran
12-15-67	Germfask School Recreation Class, Germfask, Michigan (film "The Woodduck's World") -- Off Refuge	39	Doran
12-22-67	Germfask School Recreation Class Germfask, Michigan (film "Dr. Leaky and the Dawn of Man") -- Off Refuge	19	Doran
12-29-67	Germfask School Recreation Class Germfask, Michigan -- Off Refuge	35	Doran

D. Hunting

Upland game hunting season opened on October 1 in Upper Michigan. Ruffed Grouse numbers were up and hunting was improved over 1966. Woodcock and Sharp-tailed Grouse hunting was spotty. An early September Woodcock season produced few birds as migrations had not yet started and local birds were scattered in heavy cover.

Legal goose hunting was very limited again this year because of the two year State closure to the east and south of the refuge. A few geese were reported to have been taken east of Curtis and south of Highway U.S. 2. A number of geese were illegally killed, especially

on the property of Peter Lawrence, across from the old township dump. It is estimated that 30-50 geese might have been taken both legally and illegally in this area.

The hunting closure, recommended by the refuge and enacted by the Michigan Conservation Commission, takes in 160 square miles and has benefited the local flock considerably. More interest is being taken in this flock from a hunting standpoint and the geese are flying out more than in past years. Approximately 700 geese returned last spring and 1,300 left this fall. The spring returning number should be between 2,000 and 2,500 birds before the flock can be considered out of danger.

Duck hunting was as good or better than any recent year. Good numbers of mallards were noted in the marshes and scaup and ring-necked ducks frequented the lakes. Black duck numbers were down considerably over past years and few were noted in the bag.

Hunting conditions were excellent for the 800 big game hunters on hand for the November 18 opening. Hunter numbers were reduced nearly 40% due to a uniform opening date in Michigan and increased deer numbers in southern Michigan. Hunters removed 125 deer, only five fewer than 1966. Michigan Department of Conservation figures show a 25% decrease in hunters and a 5% decrease in kill from 1966 for Upper Michigan.

A hunter check station was maintained at Sub-headquarters during the first two days of the season. Of the 27 deer examined (14 male and 13 female), the average age was two years with the oldest being 6½ years. The average rack was five total points and there were seven 1½ year old deer (25%) included in the sample.

E. Violations

Violations on the refuge remained at a low level for the second straight year. Acceptance of the goose closure was excellent by local people and deer season work consisted only of routine patrol.

Harry Lee Burton, Germfask, was arrested on February 17 by GMA Branzell and arraigned before a U.S. Commissioner at Marquette. Bail was posted and a hearing set for April to hear the charge against Mr. Burton for operating a motorized snow sled on the refuge and its dikes. A fine of \$75.00 was set and paid. The violation took place November 16, 1965, with Assistant Manager Orlynn J. Halladay as the apprehending officer. Thiel Musselman, also operating a snow sled with Mr. Burton, paid \$50.00 on the same charge at an earlier date.

On October 21, several shots were heard on what is known as the Kaysner place, across from the old township dump (Sec. 10, T44N, R13W), adjacent to the refuge and within the closed goose hunting

area. Upon later investigation several shells, goose feathers and blood were found in and around several blinds.

The area was watched each weekend and on November 5 two vehicles with five hunters entered the area. A number of shots were heard and State Conservation Officers Leslie Walstrom and John Mattson and Wildlife Biologist Updike stopped the men to check them. George Kaysner, Sault Ste. Marie, and Donald Grocella, Bloomfield Hills, checked out and no violations were observed. Leo Bell, Brimley, was hunting without a license and paid \$25.00 plus costs in State court. Michael O'Connell, student at Marquette, was hunting without a license and is charged with transportation of a loaded gun in a vehicle. Case is pending in State court.

Hal Smith, Sault Ste. Marie, held a shotgun on the officers and threatened to shoot them. It was some time before he could be persuaded to put the gun aside. Mr. Smith is being charged in State court with failure to show a license upon demand and interfering with the duties of an officer. He will also quite possibly be taken into Federal court on an assault charge, as F.B.I. agents are investigating.

With the deer season there were the usual incidents of people driving under wire gates and travelling unauthorized roads.

F. SAFETY

Monthly SAFETY meetings were held on the last Monday of each month. In addition to the regular monthly SAFETY meetings, bi-weekly (every Tuesday and Thursday) SAFETY meetings were held from June through September. All personnel participated in these discussions, with the monthly meetings being conducted by a member of the permanent staff. Listed below are the discussion leaders and topics of monthly meetings.

<u>Month</u>	<u>Topic</u>	<u>Discussion Leader</u>
January	Safe Use of Chemicals	Orlich
February	First Aid	Updike
March	Bureau SAFETY Policy	Doran
April	Woods SAFETY	Hubbard
May	Water Control SAFETY	Updike
June	Water SAFETY (Swimming and boating)	Doran
July	Fire Plan	Hubbard

<u>Month</u>	<u>Topic</u>	<u>Discussion Leader</u>
August	Safe Hunting Practices	Doran
September	Bureau Boating SAFETY	Updike
October	Herbicide Spraying	Orlich
November	SAFETY Chains for Chain Saws	Wilbrecht
December	Axework (Brushing and Limbing)	Doran

At the close of the year the station SAFETY record was 969 days without a lost-time accident. One major accident occurred to Seney personnel during the year. On December 19, 1967 Refuge Forester Bernard S. Hubbard was involved in a motor vehicle accident. Mr. Hubbard was driving on icy roads, lost control of the vehicle and rolled over. Damage to the 1965 Dodge 4x4 was \$489.64. No personal injuries resulted from this accident.

One minor accident also occurred at Seney during the period. On August 23, 1967 Refuge Forester Hubbard was driving on Riverside Dike when a branch went through the grill pushing the radiator of the Dodge 4x4 into the fan. This resulted in a \$53.10 repair bill.

No other accidents, minor or major, occurred during the reporting year.

Seney's Safe Work Practices Handbook was revised and several new additions incorporated. This handbook has greatly improved the SAFETY program at this station. All new employees, permanent and temporary, are required to read this book as part of their orientation to the refuge program.

SAFETY equipment constructed and installed during the year included hangers for ring life-preservers at water control structures and public use areas; and guard for 4x4 water control structures. SAFETY equipment purchased and put in use included SMV (Slow Moving Vehicle) signs; hard hats and liners; axe sheaths; first aid kits in all vehicles and equipment; air filtering masks for working the peat-land farm fields; and colored goggles for use when operating the snowmobiles.

Life Preserver Hangers

Seventeen life preservers hangers were constructed and installed near spillways and areas of heavy public use during the year. Ring bouys, attached to 50 feet of rope were placed in each hanger.

Dynamite Boxes

Boxes to transport dynamite and caps to and from the storage bunker were constructed and placed in use.

Dynamite Destroyed

Nine cases of dynamite had deteriorated to the extent of being a SAFETY hazard. Mr. Claude Jewett of Manistique, Michigan was hired to dispose of the jelled dynamite. A fee of \$20.00 was charged for this service.

VII. OTHER ITEMS

A. Items of Interest

Wilderness Hearing

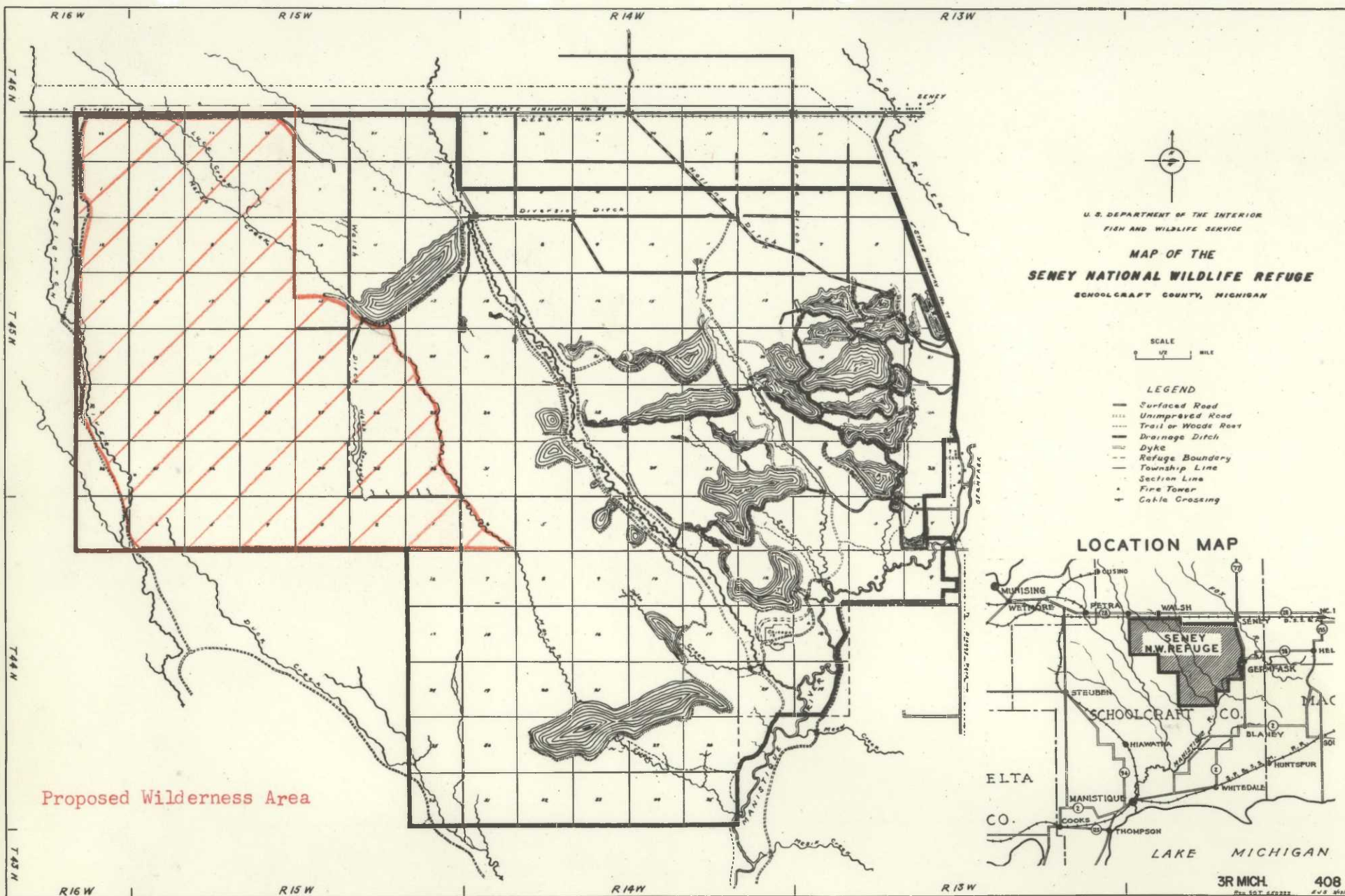
Wilderness hearings regarding Seney and the Huron Islands National Wildlife Refuges took place on May 10 in the Northern Michigan University Union Building, Marquette, Michigan. Mr. Danial Janzen, former Bureau Director, presided over the Hearings. Mr. Les Dundas, Staff Specialist, Minneapolis, was in charge of all Wilderness Study Proposals in Region III and Mr. Frank Martin, Assistant Refuge Supervisor, spoke on behalf of the Bureau. Attending from Seney Refuge were Refuge Manager John B. Hakala, Assistant Refuge Manager Orlynn J. Halladay and Wildlife Biologist Gerald H. Updike.

A total of 25,150 acres of Seney's 95,455 acres were proposed for Wilderness status. This 25,150 acres is in the western-most portion of the refuge as shown in Exhibit III. First proposal was for 19,150 acres but after the Hearing this was increased to the present 25,150 acre proposal. Ecology of part of the area is described in detail by Dr. M.L. Heinselman in String Bogs and Other Patterned Organic Terrain Near Seney, Upper Michigan (Ecology, Vol. 46, Nos. 1 and 2, Winter 1965).

Huron Islands Wilderness Area Proposal consists of the entire group of 8 islands or 147 acres. Huron Islands National Wildlife Refuge is located 3 miles off the south shore of Lake Superior and approximately 40 miles east of Houghton, Michigan.

Personnel -- Permanent

Bernard S. Hubbard Jr. of North Salem, New Hampshire, entered on duty on April 3 as forester under temporary appointment. On July 17 Bernie's appointment was converted to Career Conditional. Bernie attended high school in Saugus, Massachusetts. He received his



Batchelor's Degree in Forestry at Michigan Technological University, Houghton, Michigan. His assignment at Seney includes timber management and fire suppression. On September 30 Bernie took the big step and was wed to Coleen Anderson, daughter of Maintenceman William G. Anderson. Bernie and his wife reside in the sub-headquarters residence.

On June 3, Assistant Refuge Manager Orlynn "Joe" Halladay transferred to Death Valley National Monument, Death Valley, California. Joe entered on duty at Seney on June 2, 1964. Without his efforts, Seney's Visitor Center would not be as advanced as it is today. Joe gave hundreds of hours of his own time in setting up this program. Upon his departure we appreciated his real value when all of his duties had to be taken over. We wish Joe, his wife Bethel, and their two children Timmy and Lynette, the best of luck in their new venture.

On August 4 Refuge Manager John B. Hakala transferred back to Region I and his true home -- Alaska. Manager Hakala accepted a position as a wildlife biologist with the Bureau, working with the Atomic Energy Commission. His primary place of work is in the Aleutian Islands, but his work takes him over most of Alaska. His home office is located in Anchorage. His wife Mae, has enrolled in college there. We wish both John and Mae success in their new jobs.

To complete the near total change-over, William G. Anderson, Maintenceman, retired August 12 after working for the Bureau over 28 years. Bill's Federal Career began in 1934 as a laborer for the Bureau of Biological Survey. His entire career was spent at Seney. His employment will be long remembered by friends and associates. In recognition of his years of service Bill was presented with the Bureau's Honor Award for Commendable Service. Bill still resides on his farm east of Germfask with his wife, Elizabeth. He also is active in conservation, with the construction of two ponds on his farm. We wish Bill and Elizabeth the best for their retirement years. Bill's position has not been refilled to this date.

On September 4 Refuge Manager John E. Wilbrecht, wife Nancy, daughter Roberta and sons Erich and "Hans" joined the Seney staff. John was Refuge Manager at Crescent Lake National Wildlife Refuge, Ellsworth, Nebraska prior to coming to Seney. With the transfers of Manager Hakala, Assistant Manager Halladay and the retirement of Maintenceman Anderson during the summer months, Seney was very "short-handed" on help. The arrival and assistance of Manager Wilbrecht was a welcome releif, especially with the piling paper-work.

Personnel -- Seasonal or Student Laborers

No Student Assistants or Wildlife Aids were hired by the Regional

Office for this station. However, six college student laborers were hired by the refuge. Three of these laborers filled in as Student Assistants and one as a Forestry Aid. Also, three high school students were employed under the President's Youth Opportunity Campaign.

Student laborers were given the opportunity to participate in most aspects of the refuge program. This included public relations -- conducting the guided auto tour, attending the information counter at the Visitor Center and cleaning of picnic areas; working with waterfowl -- helping with goose drives and banding, participating in the Dew Line Duck Banding Program; farming; lawn renovation; habitat improvement; building maintenance; mulching; water control; etc.

Each student was assigned a "special" project to report on in addition to the regular report on their summer activities (see page 48 for specific projects assigned to individuals).

Nature Trail

On June 22 Mrs. Ivy Balsom, 80 years old, of Milwaukee, Wisconsin, traveled the Nature Trail. It had to take a super effort to walk this 1.4 mile route. Mrs. Balsom is a member of the Wisconsin Audubon Society.

Refuge Picnic

The annual refuge employee picnic was held on July 27. This is a pot-luck gathering and usually is held at the Wigwam Area. All members of the families attended and enjoyed a fine meal and evening together.

Christmas Party

Refuge employees and their wives enjoyed a Christmas dinner and evening of entertainment at the home of Refuge Manager Wilbrecht on December 15.

Credits:

Doran - - - - - Sections I-A, III-A,C, IV-F, VI-B,C, VII-A,B,
Typing and assembly.

Hubbard - - - - - Sections III-E,F, IV-D, V-C,E,

Updike - - - - - Sections I-B, II, III-B,C,D, IV-A,B,C,E, V-A,B,
VI-D,E, VII-B,

Wilbrecht - - - - Sections III-A,B,D, VI-A, Editing.

<u>Name</u>	<u>School</u>	<u>Curriculum</u>	<u>Position</u>	<u>Project</u>
* Tommy J. Early	Ohio State University, Columbus, Ohio	Wildlife Management	Laborer	Ring-necked Duck Study
Anthony D. Handrich	Northern Michigan University, Marquette, Michigan	English	Laborer	Woodcock Study
Susan L. Jack	Northern Michigan University, Marquette, Michigan	Biological Education	Laborer	
* Harold E. Miller	Northern Michigan University, Marquette, Michigan (graduated)	Wildlife Management	Laborer	Spruce Grouse Study
* Kim R. Strawe	Lake Superior State College, Sault Ste. Marie, Michigan	Wildlife Management	Laborer	Nesting Box Survey
* Larry S. Strecker	Michigan Technological Univer- sity, Houghton, Michigan	Forestry Management	Laborer	Jack Pine Yield Table
Ronald R. Anderson	Attending Newberry High School, Newberry, Michigan		President's Y.O.C.	
Louis Berry	Attending Manistique High School, Manistique, Michigan		President's Y.O.C.	
Gary Luukkonen	Attending Newberry High School, Newberry, Michigan		President's Y.O.C.	

* Filled in as Student Assistants and Forestry Aid.

SIGNATURE PAGE

Submitted by:

John E. Wilbrecht
(Signature)

John E. Wilbrecht
Refuge Manager

Title

Date: February 9, 1968

Approved, Regional Office:

Date: FEB 13 1968

James A. Carpenter
(Signature)

James A. Carpenter
Regional Refuge Supervisor

Int. Dup. Sec.,

3 -1750a

Cont. NR-1

(Rev. March 1953)

WATERFOWL

(Continuation Sheet)

REFUGE SoneyMONTHS OF January 1 TO April 30, 19 67

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total
	3/12-18 11	3/19-25 12	3/26-4/1 13	4/2-8 14	4/9-15 15	4/16-22 16	4/23-29 17	4/30 18		
Swans:										
Whistling						2	5		49	
Trumpeter										
Geese:										
Canada		10	250	500	650	700	650	650	19,970	
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard		5	50	100	150	175	150	150	4,560	
Black		5	50	75	100	125	75	75	3,785	
Gadwall										
Baldpate					5	10	35	35	385	
Pintail					10	25	30	30	485	
Green-winged teal				5	25	100	50	40	1,300	
Blue-winged teal						10	100	120	890	
Cinnamon teal										
Shoveler										
Wood					5	20	40	60	515	
Redhead										
Ring-necked				10	50	350	450	500	6,520	
Canvasback										
Scaup				5	20	20	50	50	725	
Goldeneye		10	20	60	40	10	10	10	1,060	
Bufflehead			10	20	50	50	100	100	1,710	
Ruddy										
Other										
Cannon Merganser				10	50	20	30	30	600	
Hooded Merganser				10	30	30	40	40	810	
Coot:							2	5	49	

(over)

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans	49	5	
Geese	19,970	700	
Ducks	23,545	1,240	
Coots	49	5	

Data Class B for geese and swans.
Data class C for ducks and coots.

SUMMARY
Principal feeding areas <u>All pool areas, marshes and farm</u> <u>units.</u>
Principal nesting areas <u>Geese nest on islands, ducks on</u> <u>marsh edge and dikes.</u>

Reported by Gerald H. Updike
Gerald H. Updike, Wildlife Biologist

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Seney

MONTHS OF May TO August, 1967

(1) Species	(2) Weeks of reporting period									
	5/1-8	5/9-15	5/16-22	5/23-29	5/30-6/5	6/6-12	6/13-19	6/20-26	6/27-7/3	7/4-10
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	650	650	750	1,000	1,300	1,450	1,350	1,300	1,300	1,300
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	150	150	200	250	350	325	300	300	300	300
Black	150	150	200	250	275	250	250	250	250	250
Gadwall										
Baldpate	35	30	20	10						
Pintail	30	20	10							
Green-winged teal	40	30	30	40	50	50	60	60	40	40
Blue-winged teal	100	100	150	200	200	250	225	200	200	200
Cinnamon teal										
Shoveler										
Wood	100	100	125	150	175	200	200	150	150	150
Redhead	10	5	5	5	5	5	5	5	5	5
Ring-necked	400	300	250	200	200	200	250	300	400	400
Canvasback		3								
Scaup										
Goldeneye	20	20	20	20	30	40	40	30	30	20
Bufflehead										
Ruddy										
Other										
Common Merganser	40	50	50	50	60	75	90	100	75	75
Hooded Merganser	50	50	50	50	50	60	75	100	150	125
Coot:	10	5								

3-1750a

Cont. NR

(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE

Sney

MONTHS OF

May

TO

August

, 19 67

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: seen	(4) Estimated total
	7/11-17	7/18-24	7/25-31	8/1-7	8/8-14	8/15-21	8/22-28	8/29-31			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	143,650	175	675
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	300	300	300	300	300	300	300	300	33,675	12	175
Black	250	200	200	200	200	200	200	200	25,175	9	100
Gadwall											
Baldpate							50		765		
Pintail							5	5	165		
Green-winged teal	30	30	30	40	50	50	60	60	5,230		
Blue-winged teal	200	200	200	200	200	300	400	300	25,275	13	175
Cinnamon teal											
Shoveler				5		5	5		80		
Wood	150	150	150	150	150	150	150	150	18,150		
Redhead	10	10	10	10	10	10	10	10	695	1	5
Ring-necked	400	375	350	350	350	350	350	350	36,625	46	275
Canvasback											
Scaup											
Goldeneye	20	20	20	20	20	20	20	20	3,050	3	30
Bufflehead											
Ruddy											
Other											
Coots:											
Common Merganser	75	75	75	75	75	75	75	75	8,620	12	100
Hooded Merganser	125	125	125	125	125	125	125	125	11,345	6	150

(over)

	(5)	(6)	(7)		SUMMARY
	Total Days Use :	Peak Number :	Total Production :		
Swans	0	0	0	Principal feeding areas	All pool areas, marshes and
Geese	143,650	1,450	675		farm units.
Ducks	172,650	1,600	1,010	Principal nesting areas	Geese nest on islands, ducks on
Coots	0	100	100		marsh edges and dikes.
				Reported by	Gerald H. Updike, Wildlife Biologist

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Seney

MONTHS OF September 1 TO December 31, 19 67

(1) Species	(2) Weeks of reporting period									
	: 9/1-8 1	: 9/9-15 2	: 9/16-22 3	: 9/23-29 4	: 9/30-10/6 5	: 10/7-13 6	: 10/14-20 7	: 10/21-27 8	: 10/28-11/3 9	: 11/4-10 10
Swans:										
Whistling										2
Trumpeter										
Geese:										
Canada	1,300	1,500	1,450	2,000	4,000	6,000	4,500	4,000	4,000	3,600
Cackling										
Brant										
White-fronted										
Snow							30	100	75	20
Blue							30	100	75	20
Other										
Ducks:										
Mallard	300	350	500	600	700	1,200	1,400	1,000	600	150
Black	200	300	400	325	600	800	600	1,050	500	225
Gadwall										
Baldpate	50	200	200	300	600	400	200	50		
Pintail	5	10	5	10	10					
Green-winged teal	40	50	50	75	100	350	100	150	50	5
Blue-winged teal	300	600	500	300	300	100	200	100	20	
Cinnamon teal										
Shoveler	5	5	10	5						
Wood	150	200	300	325	250	150	100	50	25	
Redhead	10	10	10	15	15	15	10	10		
Ring-necked	350	400	400	1,000	2,500	9,000	10,000	2,000	500	100
Canvasback								5		
Scaup						5	10	40		
Goldeneye	20	20	30	30	30	40	40	30	20	20
Bufflehead					5	5	10	10	20	10
Ruddy										
Other										
Hooded Merganser	75	100	75	75	75	150	250	500	300	250
Common Merganser	125	75	75	75	150	100	150	150	50	50
Coot	1				20	30	75	75	90	25

3-1750a
Cont. NR
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Seney

MONTHS OF September 1 TO December 31, 1968

(1) Species		(2) Weeks of reporting period							(3) Estimated	(4) Production
		11/1-17	11/18-24	11/25-12/1	12/2-8	12/9-15	12/16-22	12/23-29	12/30-31	Broods: Estimated
		11	12	13	14	15	16	17	18	days use : seen : total
Swans:										
Whistling		2							28	
Trumpeter										
Geese:										
Canada		1,600	50						238,000	
Cackling										
Brant										
White-fronted										
Snow									1,575	
Blue									1,575	
Other										
Ducks:										
Mallard		50	10						48,020	
Black		75	5						36,950	
Gadwall										
Baldpate									14,000	
Pintail									280	
Green-winged teal									6,790	
Blue-winged teal									16,940	
Cinnamon teal										
Shoveler									175	
Wood									10,050	
Redhead									665	
Ring-necked		10							103,020	
Canvasback									35	
Scaup									385	
Goldeneye		20	5	5					2,170	
Bufflehead									420	
Ruddy										
Other Hooded Merganser		50	5						13,335	
Common Merganser		10							7,070	
Coots		5							2,240	

(over)

(OASL)

	(5)	(6)	(7)		SUMMARY
	Total Days Use :	Peak Number :	Total Production :		
Swans	28	2		Principal feeding areas	Geese: Diversion Field, Sub-Hoags area, E-1, D-1, E-1, F-1, H-1 and G-3 Pools.
Geese	241,150	6,000		Ducks: E-1, E-1, F-1, G-1, H-1, I-1, J-1, Lower Goose Pen and G-3 Pools	
Ducks	341,915	13,070		Principal nesting areas	
Coots	2,240	90			
				Reported by	Gerald H. Opake, Wildlife Biologist

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751

Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS

(other than waterfowl)

Refuge SeneyMonths of January 1 to April 30 1956

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Pied-billed Grebe	1	3/10	20	4/27	Summer Resident					50
Horned Grebe	1	4/27	1	4/27	1	4/27				1
Common Loon	2	4/13	10	4/30	Summer Resident					15
American Pittern	1	4/28	1	4/28	Summer Resident					5
Great Blue Heron	1	3/28	6	4/30	Summer Resident					20
Sandhill Crane	3	3/31	15	4/22	Summer Resident					50
Whooping Crane *	3	4/19	3	4/19	3	4/19				3
Data Class D										
* Observed and reported by Mgr. Hakala										
II. <u>Shorebirds, Gulls and Terns:</u>										
Woodcock	1	3/27	300	4/30	Summer Resident					600
Common Snipe	2	4/9	200	4/30	Summer Resident					500
Greater Yellowlegs	1	4/20	150	4/30	Summer Resident					350
Killdeer	1	3/29	50	4/30	Summer Resident					100
Gulls	6	3/31	30	4/20	Transient Summer Resident					50
Data Class D										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove	1	4/29	3	4/30	5
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Golden eagle					
Duck hawk					
Horned owl	Resident				20
Magpie					
Raven	Resident				30
Crow	2	3/6	300	4/1	1,000
Marsh Hawk	1	3/12	30	4/30	50
Sparrow Hawk	1	4/20	25	4/30	30
Broad-winged Hawk	4	4/4	100	4/30	150
Osprey	1	4/3	1	4/3	1
Bald Eagle	Noted throughout	10	4/20	Summer Resident	10
Data Class A for Bald Eagles					
Data Class D for all others					
Reported by <u>Gerald H. Updike</u>					

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751

Form NR-1A

(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)Refuge SeneyMonths of May to August 1947

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production		(6) Total Estimated Number
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young
I. Water and Marsh Birds:									
Pied-billed Grebe	Summer Resident								50
Common Loon	"	"	III				14	22	50
Great Blue Heron	"	"	II						125
American Bittern									150
Sora Rail									70
Virginia Rail									50
Sandhill Crane							40	60	125
II. Shorebirds, Gulls and Terns:									
Woodcock	Summer Resident								10
Wilson Snipe	"	"							75
Killdeer	"	"							30
Greater Yellowlegs	"	"							5
Spotted Sandpiper	"	"							3
Solitary Sandpiper	"	"							2,000
Black Tern	"	"							350
Common Tern	"	"							150
									100
									150
									50
									500
									100

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove					
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow Bald Eagle Osprey Pigeon Hawk Sparrow Hawk Sharp-shinned Hawk Marsh Hawk		Permanent Resident Permanent Resident Summer Resident " " " " "		2 3	100 200 30 100 50 350 13 2 8 30 12 70
Reported by.....					

Gerald H. Urdike, Wildlife Biologist

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number the species using the refuge during the period concerned

3-1751

Form NR-1A
(Nov. 1945)Refuge SoneyMIGRATORY BIRDS
(other than waterfowl)Months of September 1 to December 31 19567.

(1) Species Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production		(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young
I. Water and Marsh Birds:									
Common Loon	Summer Resident				2	9/17			50
Pied-billed Grebe	Summer Resident								70
Hoebill's Grebe	4	10/31	4	10/31	4	10/31			4
American Bittern	Summer Resident								150
Great Blue Heron	Summer Resident				1	10/31			100
Green Heron	Summer Resident								10
Sandhill Crane	Summer Resident				1	10/16			125
Sora Rail	Summer Resident								70
Virginia Rail	Summer Resident								50
II. Shorebirds, Gulls and Terns:									
Woodcock	Summer Resident		2,500	9/15-10/1					3,000
Common Snipe	Summer Resident		300	9/15 - 10/15	2	10/31			350
Greater Yellowlegs	Summer Resident				2	11/1			200
Killdeer	Summer Resident				3	10/9			150
Spotted Sandpiper	Summer Resident								150
Solitary Sandpiper	Summer Resident								50

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove					2
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Golden eagle					
Duck hawk					
Horned owl	Resident				30
Magpie	1 11/16	2	12/20	Winter Resident	5
Snowy Owl	Resident				50
Raven	Summer Resident	300	9/15	14 12/20	350
Crow	Summer Resident			2 9/15	75
Marsh Hawk	Summer Resident			1 12/20	50
Rough-legged Hawk	Summer Resident	24	10/11	1 12/2	12
Bald Eagle	Summer Resident				
Reported by.....					

Gerald H. Updike Wildlife Biologist

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number the species using the refuge during the period concerned

3-1750b

Form NR-1B

(Rev. Nov. 1957)

UNITED STATES

DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITATRefuge SeneyFor 12-month period ending August 31, 1967

Reported by

Title

Wildlife BiologistGerald H. Iodike

(1)	(2)	(3)	(4)	(5)
Area or Unit	Habitat		Breeding	
Designation	Type Acreage	Use-days	Population	Production
UNIT I	Crops	Ducks	860	1,100
	Upland	Geese	240	360
	Marsh	Swans	0	0
	Water	Coots	0	0
	Total	Total	1,100	1,460
UNIT II	Crops	Ducks	150	200
	Upland	Geese	105	220
	Marsh	Swans	0	0
	Water	Coots	0	0
	Total	Total	255	420
UNIT III	Crops	Ducks	290	300
	Upland	Geese	85	75
	Marsh	Swans	0	0
	Water	Coots	0	0
	Total	Total	375	375
TOTAL	Crops	Ducks	1,300	1,600
	Upland	Geese	430	675
	Marsh	Swans	0	0
	Water	Coots	0	0
	Total	Total	1,730	2,275
	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	Total		
	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	Total		
	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	Total		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.
- (5) **Production:** Estimated total number of young raised to flight age.

3-1750c
Form NR-1C
(Sept. 1960)

WATERFOWL HUNTER KILL SURVEY

Refuge Soney

Year 196⁷

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
			NONE (No Hunting) ALLOWED ON THIS REFUGE					

(over)

INSTRUCTIONS

- (1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.
- (2) The goal is to survey a minimum of 25 percent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 percent goal cannot be achieved, particular care should be taken to collect representative data.
- (3) Record the total number of hours the hunters spent hunting on the refuge.
- (4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).
- (5) Record total numbers of waterfowl bagged.
- (6) Record total numbers of waterfowl reported knocked down but not recovered.
- (7) Total of Columns 5 and 6.
- (8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).
- (9) Kill sample projected to 100 percent. $\text{Column 9} = \frac{\text{Column 8}}{\text{Column 2}} \times \text{Column 7}.$

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Seney

Months of January 1 to April 30, 1967

(1) Species	(2) Density	(3) Young Produced	(4) Sex Ratio	(5) Removals	(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres Per Bird Number broods observed Estimated Total	Percentage	Hunting For Re- stocking For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Spruce Grouse	Spruce-Jackpine Forest, 5,000 acres	40		0 0 0	125	Incidental Observations Data Class D
Ruffed Grouse	Upland pine, hardwood and swamp edge -- 30,000 acres	30		0 0 0	1,000	Incidental Observations Data Class D
Sharptailed Grouse	Brushland, open ground, farm units, roads and dikes -- 10,000 acres	35		0 0 0	250	Incidental Observations and Dance Ground Counts Data Class C
						Gerald H. Updike
						Gerald H. Updike Wildlife Biologist

INSTRUCTIONS

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Seneey Months of May to August, 1967

(1) Species	(2) Density	(3) Young Produced	(4) Sex Ratio	(5) Removals	(6) Total	(7) Remarks			
Common Name	Cover types, total acreage of habitat	Acres Per Bird	Number broods observed Estimated Total	Percentage	Hunting For Re- stocking For Research	Estimated number using Refuge Pertinent information not specifically requested. List introductions here.			
(2) Ruffed Grouse	Upland pine, hardwood and swamp edge. 30,000 acres	16	8	950	0	0	0	1,900	Incidental observations
(3) Sharp-tailed Grouse	Brushland, open terrain, farm units, roads and dikes. 10,000 acres	35	6	200	0	0	0	350	Spring census and incidental observations
Spruce Grouse	Spruce and jack- pine forest 5,000 acres	40	4	50	0	0	0	125	Incidental observations
(5) SPECIES:									
(7) SPECIES:									

FORM NO-5 - ALIYAND CAME BIRDS.

INSTRUCTIONS

Gerald H. Upsike
Wildlife Biologist

Gerald H. Updike
Wildlife Biologist

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

*Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Refuge Calendar Year 1967

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White- tailed Deer	Variable - marshland, hardwoods, conifers, brushland and open ground -- 80,000 acres	U	125	0	0	0	U	U	0	0		1,600*	50	
Black Bear	Variable - marshland, hardwoods, conifers, brushland and open ground -- 80,000 acres	U	1	0	0	0	U	U	0	0		25		

Remarks: * Based upon deer observed per 100 man-hours in the field and hunting season results.

Reported by Gerald H. Updiko, Wildlife
Biologist

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge: once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Seney

Year ending April 30, 1967

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Popula- tion
								Permit Number	Trappers Share	Refuge share				
Beaver														150
Mink				34	3				17	17	17	3		550
Muskrat				60					30	30	30			1,200
Otter														150
Raccoon					49								49	200
Coyote					29				26			1	2	50
Red Fox					1							1		10
Bobcat					6				6					10
Porcupine					9								9	250
Striped Skunk					7								7	100
Woodchuck					3								3	200
Snowshoe Hare														1,000
Red Squirrel					4								4	400
Gray Squirrel														80

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS: Census figures are questionable estimates based on incidental observations by the refuge staff.

Figures are of Data Class D.

Gerald H. Updike
Reported by Gerald H. Updike, Wildlife Biologist

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
- (2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
- (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
- (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

3-1755

Form NR-5
60701

DISEASE

Refuge SeneyYear 1967

Botulism

Period of outbreak _____

Period of heaviest losses _____

Losses:

	Actual Count	Estimated
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.) _____

Condition of vegetation and invertebrate life _____

Remarks _____

Lead Poisoning or other Disease

Kind of disease Unknown (See Remarks)Species affected Canada Goose

Number Affected Species	Actual Count	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____

Number Recovered 5Number lost 75

Source of infection _____

Water conditions NormalFood conditions NormalRemarks Fatal to goslings which are seriously infected. A crippling is noticed and goslings are unable to keep up with the broodLeucocytozoon and/or Aspergillosis
are suspected contributing factors.

Dir or, BSF&W, Washington, D. C. (RF)

~~Regional Director, Minneapolis, Minnesota~~

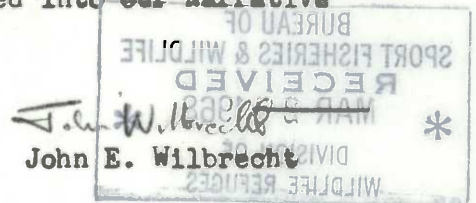
March 22, 1968

Refuge Manager, Seney Refuge, Seney, Michigan

Refer to: RF

Corrected NR-6 Form

Attached are two corrected copies of NR-6. Specifically we corrected the error in Recreational Visits as a result of the error previously reported in the Public Use Report for C.Y. 1967. Please forward one copy to the Central Office, remove old copy and insert corrected into our Narrative Report. Sorry we didn't catch this sooner.



Attachments: 2

Dir. BSE&W, Washington, D. C. (RF)

March 22, 1968

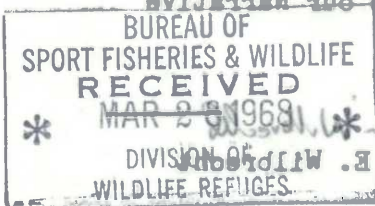
~~Regional Director, Minneapolis, Minnesota~~

Refer to: RF

Refuge Manager, Seney Refuge, Seney, Michigan

Corrected NR-6 Form

Attached are two corrected copies of NR-6. Specifically we corrected the error in Recreational Visits as a result of the error previously reported in the Public Use Report for C.Y. 1967. Please forward one copy to the Central Office, remove old copy and insert corrected into our Narrative Report. Sorry we didn't catch this sooner.



John E. Wilford

Attachments: 2

PUBLIC RELATIONS
(See Instructions on Reverse Side)

Refuge SeneyCalendar Year 1967**1. Visits**

a. Hunting 2,760 b. Fishing 5,409 c. Miscellaneous 63,641 d. TOTAL VISITS 71,810

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl			
Upland Game			
Big Game	2,760	85,200	BSF&W
Other			

Number of permanent blinds -Man-days of bow hunting included above 0

Estimated man-days of hunting on lands adjacent to
refuge 4,000

1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	7,000	
Streams and Shores		21

1c. Miscellaneous Visits

Recreation 62,123 Official 558
Economic Use 960 Industrial 0

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	On Refuge		Off Refuge	
	NO. OF GROUPS	NUMBER IN GROUPS	NO. OF GROUPS	NUMBER IN GROUPS
Sportsmen Clubs				
Bird and Garden Clubs				
Schools	9	709	1	60
Service Clubs			3	200
Youth Groups	1	155		
Professional-Scientific			4	113
Religious Groups				
State or Federal Govt.			22	823
Other				

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	10	Radio Presentations	2
Newspapers (P.R.'s sent to)	23	Exhibits	
TV Presentations		Est. Exhibit Viewers	

Marsh and aquatic _____
Hedgerows, cover patches _____
Food strips, food patches _____
Forest plantings _____

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Seney County Schoolcraft State Michigan

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
Buckwheat					11	Failure	11		
Buckwheat	10	250 bu.	2	50 bu.	32	784 bu.	44	Oats seedings, includes alsike, ladino, brone	
Oats	55	1,925 bu.			39	936 bu.	94		
Winter rye (ripe)					25	506 bu.	25 (1966)		
Winter rye					27	4 ton	27	Winter rye - browse	27
New hay seedings					94	24 ton	94		94
Fallow Ag. Land. Diversion									4.0 Acres

No. of Permittees: Agricultural Operations 1 Haying Operations 1 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	Grazing	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa, red, ladino, alsike clovers, brone mixtures	355.5 ton	222		1. Cattle				None
	(Refuge received 53.2 tons of above as share -- used for mulch)			2. Other				None
				1. Total Refuge Acreage Under Cultivation				421
Hay - Wild				2. Acreage Cultivated as Service Operation				119

DIRECTIONS FOR PREPARING FORM NR--8'
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops Specify the acreage kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting

Total Refuge Acreage Under Cultivation Report total land area devoted to agricultural purposes during the year.

REFUGE GRAIN REPORT

Refuge SeneyMonths of January through December, 1957

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Corn, shelled	625 bu	410 bu	1,035 bu	0 bu	0 bu	445 bu	445 bu	425 bu	0 bu	425 bu	0 bu
Corn, eared	115 bu	144 bu	259 bu	0 bu	0 bu	115 bu	115 bu	144 bu	0 bu	144 bu	0 bu
Buckwheat	40 bu	50 bu	90 bu	0 bu	40 bu	0 bu	40 bu	50 bu	50 bu	0 bu	0 bu
Ausable Oats	3 bu	0 bu	3 bu	0 bu	3 bu	0 bu	3 bu	0 bu	0 bu	0 bu	0 bu
Gary Oats	12 bu	75 bu	87 bu	0 bu	69 bu	0 bu	69 bu	18 bu	18 bu	0 bu	0 bu
Balbo Winter Rye	74 bu	0 bu	74 bu	0 bu	66 bu	0 bu	66 bu	8 bu	8 bu	0 bu	0 bu
Proso Millet	475 lb	0 lb	475 lb	0 lb	175 lb	0 lb	175 lb	300 lb	300 lb	0 lb	0 lb

(8) Indicate shipping or collection points _____

(9) Grain is stored at Granary in stone building and metal grain bins.(10) Remarks Condition good.

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

TIMBER REMOVAL

Refuge Saney Year 1967

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
Lawrence Zellar	2	Entrance Road	32	20 cords	Service	None	cut only dead and/or down trees	Jack Pine and Black Spruce

Total acreage cut over 32 Total income None

No. of units removed B. F. 20 Method of slash disposal Scatter
Cords 20
Ties

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Seney

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number

Reporting Year

67-1

1967

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
October	Tag Alder	Islands in C-2 Pool	5	2,4,5-T, 2,4-D mixed	-	16 lb. A.E./ 100 gal. fuel oil	Fuel oil	Hand sprayer

10. Summary of results (continue on reverse side, if necessary)

Results unknown. Saturate freshly cut tag alder brush stumps on goose nesting islands to retard regrowth.

Fig. 1. Seney Refuge permanent staff -- left to right, front row: Maintenceman Glen C. Losey, Refuge Clerk Omer L. Doran, Refuge Manager John E. Wilbrecht, Mechanic George Orlich. Back row: Refuge Forester Bernard S. Hubbard Jr., Wildlife Biologist Gerald H. Updike.

Jan. 10, 1968

R 160-7

Miller

Fig. 2. Seney Refuge temporary staff -- left to right: Paul Thibideau, seasonal laborer; Tom Early, student laborer; Harold Miller, student laborer; Louis Berry, Y.O.C.; Lawrence Zellar, seasonal laborer; Susan Jack, student laborer; Larry Strecker, student laborer; Duane Lawrence, seasonal laborer; Kim Strawe, student laborer; Ronald Anderson, Y.O.C.; Gary Luukkonen, Y.O.C. (Not pictured are Thurman Skarritt Jr., seasonal laborer; and Anthony Handrich, student laborer.)

Aug. 24, 1967

R 157-5

Updike



Fig. 3. The manager's residence presents a peaceful setting surrounded by frozen pools during the long Seney winter.

Feb. 2, 1967

R 131-1

Halladay

Fig. 4. The first geese returned March 19 when all pools were frozen over. More geese followed and break-up was April 1.

March 27, 1967

R 134-11

Hakala



Fig. 5. Cannon net set up at F-1 Pool to capture early returning crows which constitute a threat to nesting geese. Shell corn used for bait.

March 27, 1967

R 134-1

Hakala

Fig. 6. Maintenanceman Glen Losey and Biologist Gerald Updike "sacking" crows from a successful shot. Blood samples were taken and a few crows held for research purposes.

March 27, 1967

R 134-9

Hakala

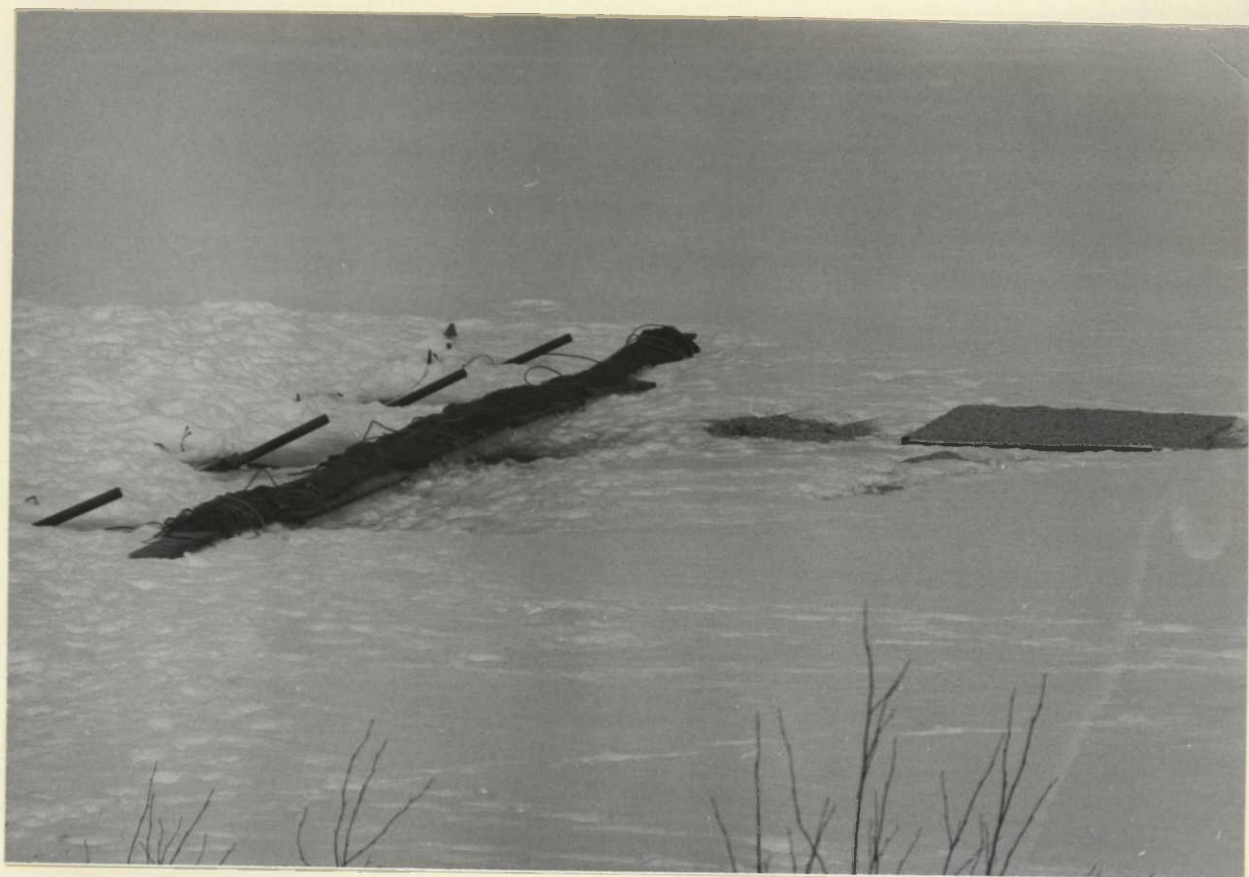


Fig. 7. Laborer Lawrence Zellar removing gravel from old road across Chicago Farm. Gravel was used to repair Marsh Creek Road.

June 6, 1967

R 143-2

Updike

Fig. 8. Washout along Marsh Creek Road. Small plugged culvert was replaced with large culvert.

July 12, 1967

R 140-10

Hakala



Fig. 9. Steel trapping for coyote also resulted in the capture of several raccoons.

May 15, 1967

R 138-11

Updike

Fig. 10. Red fox were commonly observed near sub-headquarters. A few, as with this fox, were caught by steel trapping.

July 27, 1967

R 153-2

Early



Fig. 11. Late spring storms create a hazard for nesting birds such as this killdeer at headquarters.

May 11, 1967

R.O. Photo 001770

Winship



MAR 1967

001770

Fig. 12. Michigan Department of Conservation personnel remove fish from refuge pools by using a fyke net (background). Fish are held in wire cages until transferred to local lakes and spawning marshes.

April, 1967

R 136-8

Hakala

Fig. 13. Frank Martin, Assistant Refuge Supervisor, presents Bureau's viewpoint on proposed Seney-Huron Islands Wilderness Areas. Public hearing was held May 10 on Northern Michigan University campus, Marquette.

May 10, 1967

R 138-1

Halladay

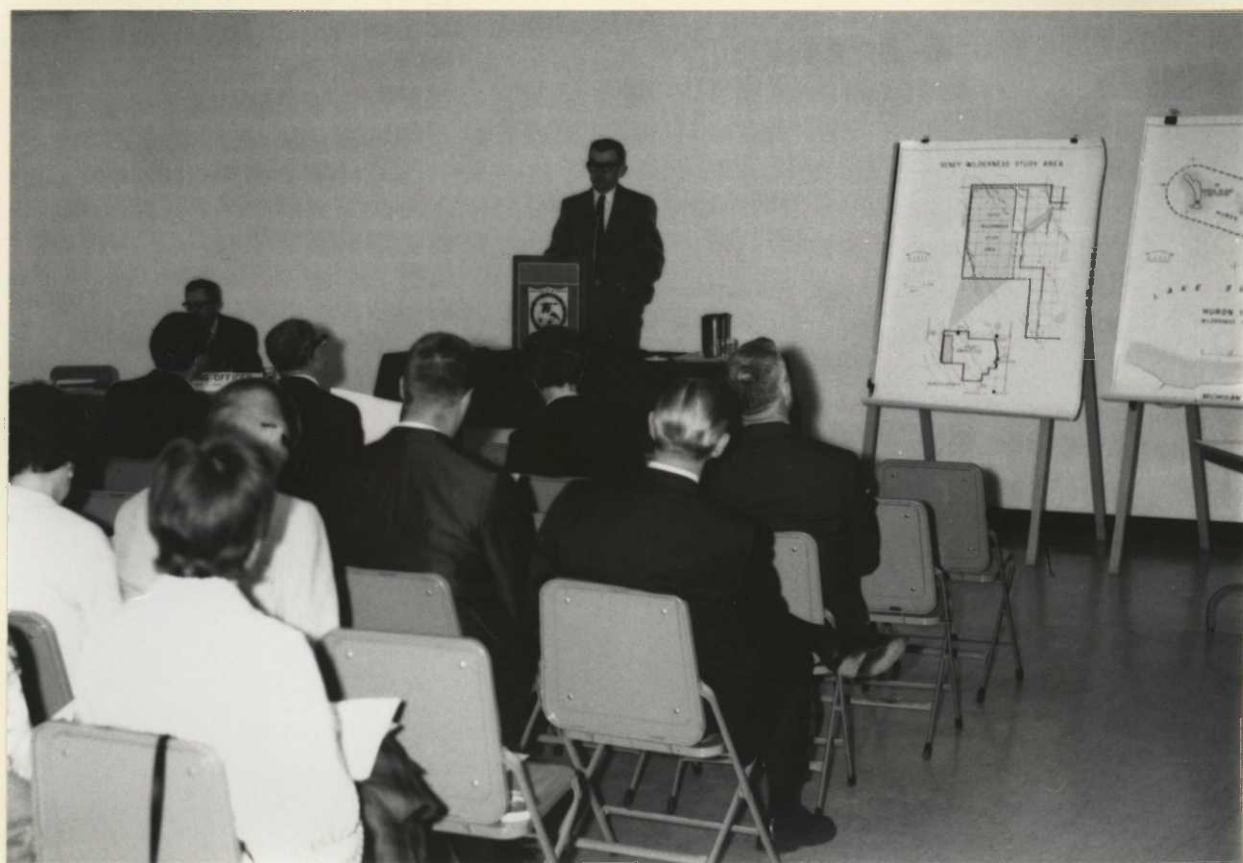
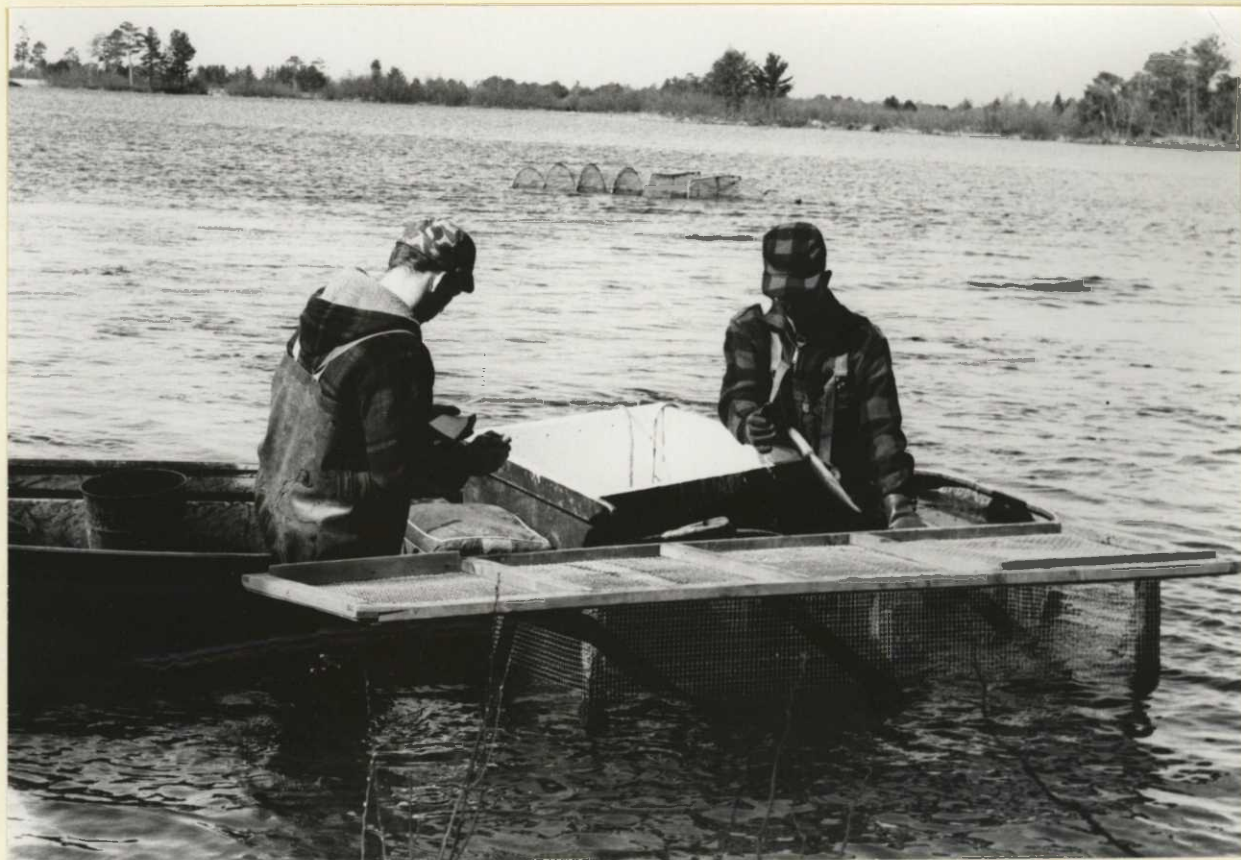


Fig. 14. Part of the 25,150 acre area at Seney studied and proposed to be included in the Wilderness Areas program. Photo shows north-south ridges and smaller east-west ridges which contribute to make up this unique string bog situation.

April 9, 1967

R.O. Photo 001571

Winship



APR 9 1967

001571

Fig. 15. Land between Lower Goose Pen and Sub-headquarters Field was cleared, leveled and seeded. Geese, migrant and resident, made excellent use of the sprouting rye.

April, 1967

R 135-2

Hakala

Fig. 16. Double hooded merganser embryo found during nest box check. Female had abandon the egg which held these well developed embryos.

June 26, 1967

R 140-4

Updike



Fig. 17. Several family groups were captured at headquarters for blood samples. Research Aid Bill Neill, Dr. Barry Tarshis of Patuxent and Biologist Gerald Updike handling geese.

June 7, 1967

R 139-3

Hakala

Fig. 18. The old barn was renovated and has become an effective laboratory for Bill Neill and Dr. Barry Tarshis to carry on the blackfly - blood disease work being conducted by Patuxent Research Station.

April 24, 1967

R 132-11

Halladay



Fig. 19. Loading used oil for refuge roads was a dangerous and time-consuming task until.....

June 21, 1966

R 110-11

Hakala

Fig. 20.purchase of a new diaphragm pump eliminated the problems and made the work more enjoyable for laborer Paul Thibideau.

June 26, 1967

R 140-8

Udike



Fig. 21. Water pumps were installed at Driggs Picnic Area and at C-3 Picnic Area. Picnickers, fishermen, hunters and refuge personnel all benefit.

July 15, 1967

R 150-5

Updike

Fig. 22. Life preserver hangers were installed near most spillways for the SAFETY of the public and refuge personnel. Maintenance man Glen Losey places a life preserver at C-3 Pool.

June 30, 1967

R 142-7

Updike



Fig. 23. The general public and local Canada Geese combine to make the evening auto tour a popular one. Student Laborer Tom Early gives orientation talk at Visitor Center.

July 20, 1967

R 149-9

Hakala

Fig. 24. Biologist Gerald Updike explaining Canada Goose banding operation to Dr. George Hunt's University of Michigan wildlife class.

July 26, 1967

R 152-12

Hakala



Fig. 25. Lawns at headquarters, Quarters #1 and Quarters #136 were torn up, re-sloped and covered with 4-6 inches of top soil.

June, 1967

R 144-1

Updike

Fig. 26. The lawns were seeded, fertilized, mulched and continuously watered through September.

July, 1967

R 140-10

Updike



Fig. 27. Clair Rollings, Land Management Specialist, Minneapolis,
inspecting crops at Diversion Farm.

June 28, 1967

R 141-8

Hakala

Fig. 28. Hay from Diversion Farm was used to mulch nearly one
mile of badly eroded C-3 dike.

Aug. 15, 1967

R 155-7

Strawe



Fig. 29. All buildings in the headquarters area were scraped, repaired and painted. Y.O.C. Ronald Anderson and laborer Paul Thibideau work on the laboratory-barn.

Aug. 17, 1967

R 155-10

Updike

Fig. 30. Aspen and birch pulp being loaded at sale area near the Pine Creek-Manistique River junction.

July 12, 1967

R 141-9

Hakala



Fig. 31. Beaver work along the guided auto tour route was a delight to the public. Work on the red pine in the background indicates a lack of preferred food in the area.

April, 1967

R 136-2

Hakala

Fig. 32. Ring-necked Duck broods are commonly seen on Unit I pools during July and August..

July 7, 1967

R 145-4

Updike



Fig. 33. Student Laborer Tom Early removing Blue-winged Teal from modified dove traps. These traps accounted for most of the 700 teal banded and one trap caught 36 teal in one setting.

Aug. 24, 1967

R 157-7

Updike

Fig. 34. July Canada Goose drives can be a very cold experience as shown by refuge personnel in this photo. The birds were sexed, aged, weighed and banded before being released at C-3 Pool.

July 13, 1967

R 148-11

Hakala



Fig. 35. A 10 acre area adjacent to M-2 Pool burned as a result of a lightning fire in July of 1966.

July 20, 1966

R 114-1

Updike

Fig. 36. Burned area, one year later, shows excellent growth of grasses.

Aug. 25, 1967

R 158-4

Early



Fig. 37. William G. Anderson, Maintenceman, retired August 12, 1967, with nearly 30 years of Government service to his credit. Mr. Anderson received the Department of Interior's Honor Award for his commendable service.

Aug. 15, 1967.

R 155-3

Updike

HONOR AWARD

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
FOR
Commendable Service

WILLIAM H. JENSEN

In recognition of over 30 years of dedicated service to the BLM.

Mr. William H. Jensen, retired in 1974 as District Game Warden of Bismarck, North Dakota, has been awarded this honor for his many years of dedicated service to the BLM. He has been a member of the BLM since 1944 and has been a dedicated member of the BLM since 1944. He has been a member of the BLM since 1944 and has been a dedicated member of the BLM since 1944.

In recognition of his many years of dedicated service to the BLM, the Bureau of Land Management has awarded this honor to Mr. William H. Jensen.

William H. Jensen
District Game Warden

Special Agents in Charge
Bureau of Land Management
Bismarck, North Dakota

